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TERMINATOR

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GOOD ON HIS VOW
TO WIPE OUT ISIS?



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Malaysia

A melting pot of diversity

VISION 2020 IS A STATE OF MIND

As diverse in nature and culture as they are in economic opportunities, the individual states of Malaysia have propelled the evolution of the country's economy, and led to the impressive and unprecedented growth figures we have become witness to. Now, the 35th biggest economy in the world, Malaysia is also well on its way to reaching its ambitious, yet attainable, goal: to obtain high income status by the year 2020. To achieve this Vision, however, further diversification of the economy is required, and the key to this is to be found in the states that make up Malaysia, the true pillars of its economy.

Penang, dubbed the Silicon Valley of the region, is the third biggest contributor to the Malaysian economy, despite being the second smallest in size. It exemplifies the type of diversification required, shifting from being a manufacturing base to having a services orientated sector. Annie Choo, founder & managing director of Penang-based Nova Mulia Development is aware of the need to adapt in order to attract business to benefit Malaysia as a whole: "When we see what we need to improve, we improve. This is an enhancement for Malaysia, to bring the country itself to a different stage."

Traversing the breadth of Malaysia, from Penang in the far west, to Sabah in the eastern most point, it is clear to see that the economic communities have equal and vested interest in developing their businesses for Malaysia's common goal. Sabah, rich in oil and gas, is already a center for FDI and exports, still has vast amounts of promise. CEO of manufacturers TIMPLAS Industries, Joseph Hoh Thau Min asserts Sabah's potential: "Many countries within ASEAN are very close to Sabah...it is increasingly important to develop our products and services, especially for the benefit of Malaysia and Sabah." Both Penang and Sabah are positioned in such a manner as to use their dynamic sectors and strategic location to take full advantage of the ASEAN and use this as a springboard for the rest of the world.

EDUCATING SUCCESS

This willingness to progress for the betterment and future successes of the country can also be seen per sector, particularly in education. Malaysia is adopting pioneering education methods in order to build a sustainable future for the nation. The public and private sectors are focused in their mission to revolutionize education to produce a better, more globally aware Malaysia.

An increasing amount of innovative education measures are coming to the fore as Malaysia recognizes the need to move beyond traditional systems. Anne Tham, group CEO & founder of Sri Emas International School, acknowledges that there "needs to be a change, especially within the primary and secondary school scene." She also explains that the new approach is about "re-inventing education... as we are teaching them for their tomorrow, not for our today." Sri Emas International School ensures that the future generations of Malaysia will be well-equipped to enter into a competitive and critically-thinking global world.

Educational reform in Malaysia is occurring from as early as preschool and kindergarten. CEO & founder of the Brainy Bunch International Montessori, Mohd. Fadzil Hashim, believes that preschool is the fundamental time for the development of a child: "The mission of Brainy Bunch is to produce the future children of the world with the right vision, through the right education, so they will be the best citizens of the world." The Brainy Bunch and Sri Emas are gaining momentum throughout the region, supporting the idea that Malaysia is on track to produce the world's future leaders.

Malaysia's established institutions, particularly in terms of higher education, are also pivotal in terms of widening Malaysia's educational scope. Publicly financed University of Malaya (UM), the oldest and most acclaimed university in the country, is paramount to Malaysia's success. Professor Dato' Dr. Mohd. Amin Jalaludin, vice-chancellor, notes that the UM has a responsibility to boost the country's international profile by delivering graduates prepared for the global business world, and therefore aiding the development of the country: "We create students that are critical and creative thinkers that are able to create jobs, not seek jobs." Professor Jalaludin envisions a Malaysian student that will graduate as a self-sufficient and competent individual, with a capacity and knowledge that will accelerate Malaysia's transformation.

The collective drive and desire for the advancement of Malaysia has united sectors and states, this display of unity is what will propel Malaysia to Vision 2020, and beyond. ●



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BIG SHOTS

BELGIUM

Lookouts

Brussels—A sniper and an observer from the police special forces keep watch from a balcony near the Grand Place, the central square in Brussels, on November 20, after authorities imposed a lockdown on the capital while they conducted a massive manhunt for suspects involved in the November 13 attacks in Paris. Schools, shops, public transportation and restaurants were closed for several days, and police arrested 21 people as part of a sweeping counterterrorism operation. The chief target of the raids was Salah Abdeslam, who authorities believe took part in the Paris attacks and who was still at large nearly a week later.



YVES HERMAN





GREECE

Shut Out

Idomeni, Greece—An Iranian man who sewed his mouth shut in protest at the refusal of Macedonian authorities to let him cross the border sits on railroad tracks with other asylum seekers near a border crossing on November 23. Asked by Reuters where he wanted to go, the man, a 34-year-old electrical engineer named Hamid, was able to say, “To any free country in the world. I cannot go back. I will be hanged.” Slovenia announced it would grant passage only to those fleeing conflict in Syria, Iraq and Afghanistan. Macedonia and other Balkan countries quickly followed suit, tightening rules to limit those they consider economic migrants rather than refugees.



GIANNIS PAPANIKOS







U.S.A.

Let Out

New York—Jonathan Pollard, a former U.S. Navy analyst, leaves federal court in Manhattan on November 20, following his release on parole after serving 30 years of a life sentence for violations of the Espionage Act. Pollard was sentenced to life in prison in 1987 for passing classified information to Israel, in return for money. Though he was granted Israeli citizenship in 1996, and despite multiple attempts by Israeli officials to secure his release, Pollard is required to remain in the United States for five years under the conditions of his parole.



LUCAS JACKSON



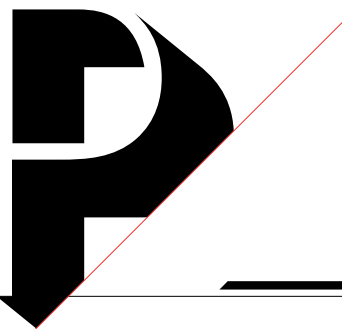
ARGENTINA

Close Out

Buenos Aires, Argentina—The city's mayor, Mauricio Macri, celebrates after winning the presidential election on November 22, ending the 12-year domination of Argentine politics by President Néstor Kirchner, who died in 2007, and his wife, Cristina, who succeeded him in office. A successful businessman and former president of the Boca Juniors football club, the conservative Macri beat Kirchner's ally Daniel Scioli, securing more than 51 percent of the vote, by appealing to social democrats, liberals and the center-right business community. The Kirchners had governed on a platform of social welfare programs for the poor and protectionist economic policies, but Argentina's economy struggled under their rule.



RICARDO MAZALAN



P A G E O N E

PARIS

~~MALI~~

RUSSIA

NASA

CRIME

ISIS

FRANCE'S SOUTHERN FRONT

The grieving country has intensified its attacks on ISIS in Syria while facing a renewed threat from Islamists in Mali, its former colony

THE GUARDS standing outside the entrance to the Radisson Blu Hotel in Bamako, the capital of Mali, didn't have time to react. Around 7 o'clock on the morning of November 20, at least two baseball-cap-wearing men in their early 20s used automatic rifles to gun down the security men, then dashed up 12 steps leading into the lobby. Moments later, a second burst of gunfire rang out.

"We could hear gunshots and people screaming," says Mukesh Chellani, a business development manager. A resident of the hotel for the past 15 years, he and 19 colleagues were at the back of the building when they heard the shots. Terrified, they looked for anything that could protect them from the gunmen's bullets. "We barricaded the door from the inside with cupboards and tables," Chellani says.

The attackers burst into the breakfast room, which was filled that morning with the usual assortment of diplomats, Air France crew

members, contractors and development officials. More than a dozen people desperately tried to squeeze inside an elevator, which holds eight; as it stalled, its door opened and a gunman raked those inside with machine gun fire. The gunmen freed the captives who could recite verses from the Koran and held the rest.

The standoff finally ended when troops stormed the hotel, killing the gunmen and releasing the survivors. The final death toll: 19 victims and two gunmen. (Some witnesses say they saw more than two gunmen, but three days after the attack, only two bodies had been found.)

The war against Islamist militants in Mali was supposed to be long over. Less than three years ago, President François Hollande of France launched Operation Serval, a military campaign aimed at rooting out about 1,000 fighters belonging to the region's Al-Qaeda affiliate—Al-Qaeda in the Islamic Maghreb—and an assortment of

BY
JOSHUA HAMMER
[@Joshuaiveshamme](#)



GROUP EFFORT:
Extremists have
claimed responsibility
for the attack
in Mali, suggesting
that they may be
collaborating.

other groups that had captured the north of Mali in early 2012. French forces chased the radicals out of Timbuktu and other towns, then fought them in a desert valley near the Algerian border. Several hundred jihadis were killed in one week of fighting in February and March 2013. “We went cave by cave, and we killed almost all of them,” I was told in 2014 by Captain Raphaël Oudot de Dainville, a French officer who commanded a company of the Foreign Legion in the valley. Clearly, some survived.

For Mali, the assault on the Radisson was the clearest sign yet that an Islamist force that seized a large part of the country—or its sympathizers—remains a threat. But the Bamako attack was also a significant strike against a more distant, and recently wounded, enemy of the Islamists: France. The country that once controlled Mali as its colonial overlord is still reeling from the November 13 Paris attacks by adherents of the Islamic State militant group (ISIS), which left 130 people dead. The storming of the Radisson one week after those killings appears to be part of the cost France has been paying for its recent attempts to take a leading role among Europe’s cautious nations in trying to fight chaos and extremism in the Middle East and parts of Africa.

“France is now perceived as being at the heart of a crusader alliance, which means they are now a target for terrorist attack,” says Raffaello Pantucci, director of international security studies at the Royal United Services Institute, a London-based defense and security think tank.

French fighter jets played a pivotal role in assisting Libyan rebels in their revolution against President Muammar el-Qaddafi in 2011, a victory that has soured as the country has split into territory controlled by warring factions. Next came the French intervention in Mali—another apparent victory in what seemed like a newly aggressive French foreign policy. In September 2014, France was one of nine countries to join a U.S.-led coalition whose goal is to defeat ISIS.

Hollande, however, shows no signs of backing away from the fight against the Islamists, promising on November 23 to “intensify” France’s attacks on ISIS. After the Radisson siege, he said, “Once again, terrorists want to make their barbaric presence felt everywhere—where they can kill, where they can massacre. So we should once again show our solidarity with our ally, Mali.”

The attack on the hotel was the seventh such attack this year in Mali. The probable architect was Mokhtar Belmokhtar, a one-eyed Algerian who fought as a holy warrior in Afghanistan in the 1980s and orchestrated the 2013 siege of an Algerian gasworks in which dozens died.



+
PEOPLE OF THE BOOK: The men who attacked the hotel released hostages who could recite from the Koran and kept the rest until they were overrun by government forces.

Al-Mourabitoun—or, the Sentinels—the militant group he founded in 2013, claimed credit for the Radisson attack. (Al-Qaeda in the Islamic Maghreb also claimed responsibility.)

What has gone wrong? Excessive optimism on the French’s part, the resilience of hardened killers, the difficulties of establishing security in a remote desert environment and poor governance in a destitute nation with few resources have all provided Al-Qaeda in the Islamic Maghreb and its affiliates plenty of room to regroup. The return of Mali’s Islamist militants to the forefront is a reminder of the challenges of waging war against Islamist radicals who often blend easily into their environments, have no compunction about attacking soft targets and are ready to sacrifice their lives for jihad.

In reality, the French were never able to pacify the north. In 2014, I spent 24 tense hours in Kidal, a mostly Tuareg town in Mali’s far northeast, weeks after Al-Qaeda in the Islamic Maghreb militants kidnapped and murdered two French radio reporters there. French troops had never secured this sand-swept outpost, and Al-Qaeda bided its time, waiting for the opportunity to reorganize and strike again.

Despite the continued insecurity, the French were highly sensitive to being perceived as an occupier of their former colony. Today, 1,000 French troops are left in Mali, down from a peak of 2,500 at the end of Operation Serval. In 2014, France transformed its mission into a regional program, Operation Barkhane, headquartered in Chad. “It further diluted the French presence

in Mali,” says Corinne Dufka, head of Human Rights Watch’s West Africa desk.

The U.N. Security Council established a Mali peacekeeping force in April 2013, with a mandate to help stabilize the country—but that mandate does not include counterterrorism operations, which fall to the Malian military and the remaining French forces. Regardless of their intended mission, the U.N. blue helmets end up facing militant attacks. They suffered 29 fatalities in Mali in 2014, the largest number of deaths for a U.N. peacekeeping mission that year, and 10 have been killed in 2015. “No mission has been as costly in terms of blood” than the U.N. force in Mali, said Hervé Ladsous, undersecretary-general of U.N. peacekeeping, in January.

The Malian army has barely been a factor in the battle against extremists. In early 2012, despite years of training by U.S. special forces and Navy SEALs, the army quickly collapsed before the militants’ offensive. Since Operation Serval, the European Union has spent \$29.4 million on extending a training program for the troops, which one Malian cabinet minister once described to me in 2014 as “the dregs of society—all the problem children, failures in school, delinquents and criminals.” That same year, Didier Dacko, commander in chief of the Malian armed forces, told me that “esprit de corps does not exist.”

Meanwhile, the Islamists appear to be growing in number. In January 2015, the ill-equipped Malian troops began having to seriously contend with a new Islamist group, the Macina Liberation Front, based around central Mali. The group has attacked villages and military posts in the center of the country and along the borders with the Ivory Coast and Burkina Faso.

The biggest failure, though, in the wake of Operation Serval’s apparently quick win, has been France’s inability to kill Belmokhtar, who slipped into the Sahara with a small band of loyalists as French forces advanced in January 2013. For the past three years, he has moved at will across the Sahara with a few dozen followers in pickup trucks. In December 2012, he split from Al-Qaeda in the Islamic Maghreb—the group’s leaders in Algeria accused him of disregarding their orders—and created a spinoff group, which carried out the Algerian gasworks attack.

Last year, Belmokhtar merged his band of fighters with a gang of Mauritanian and Malian jihadists called the Movement for Oneness and Jihad in West Africa, creating Al-Mourabitoun. In March 2015, Al-Mourabitoun gunmen shot dead five people at a café in Bamako. Three months later, two American F-15 fighter jets dropped 500-pound bombs on a gathering of jihadis in



the Libyan coastal city of Ajdabiya and claimed they had finally killed Belmokhtar. But a jihadi representative insisted that the bomb missed Belmokhtar and that no DNA evidence has been presented to confirm his death.

In August, in an operation that appears to have prefigured the November 20 attack in Bamako but passed without receiving much notice from the outside world, gunmen invaded the Byblos Hotel in the central Mali town of Sévaré. Government forces invaded the hotel after a long standoff and freed hostages; four Malian soldiers, five U.N. workers and four attackers were killed. Fighters linked to Belmokhtar claimed

“FRANCE IS NOW PERCEIVED AS BEING AT THE HEART OF A CRUSADER ALLIANCE, WHICH MEANS THEY ARE NOW A TARGET FOR TERRORIST ATTACK.”

responsibility, but troops found identification on the attackers’ bodies that identified them as belonging to the Macina Liberation Front—a worrying sign of increasing collaboration between Mali’s myriad Islamist groups.

The Radisson attack has realized the worst fears of Mali watchers. “What had been touted as the turning point for better stability has now been brought in question,” says Human Rights Watch’s Dufka. Hollande pledged to provide “necessary support” to Mali after the siege, but with France ramping up its struggle against ISIS, Mali’s former colonizer is now facing the unpalatable prospect of refighting a war it never really finished. **N**

JOSHUA HAMMER’S book *The Bad-Ass Librarians of Timbuktu: And Their Race to Save the World’s Most Precious Manuscripts* will be published in April 2016.



CRACKING THE CALIPHATE

Can hackers and Western security services win the online war against ISIS?

ONE DAY AFTER the attacks in Paris on November 13—in which young men affiliated with the Islamic State militant group (ISIS) killed a total of 130 people at six locations across the French capital—a video began making the rounds online. With its dramatic theme music and slick graphics, it looked more like an action film than an Internet release. “We are Anonymous,” the letters on the screen read. “We are uniting humanity. Expect us.”

Soon after the video emerged, members of the hacking collective Anonymous began reporting the Twitter accounts of people they believed to be supporters of ISIS to the site’s administra-

tors in the hope that the accounts would then be deleted. Anonymous claims to have already helped take down more than 20,000 ISIS-friendly Twitter profiles since the Paris attacks. The hacktivists—activists who use computers to achieve their political goals—often include the same hashtag in their tweets: #OpParis, a rallying cry against the militants.

The war against ISIS takes many forms. Both Russia and a U.S.-led coalition are conducting airstrikes against the group, hoping to destroy its command centers, supply stores and training camps. The U.S. is also arming moderate rebels to help defeat the militants. And in the virtual

BY
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@MirrenGidda

+
**FAWKES AND
HOUNDS: Hackers
for Anonymous are
exposing Twitter
accounts used by
ISIS for recruiting
and propaganda.**

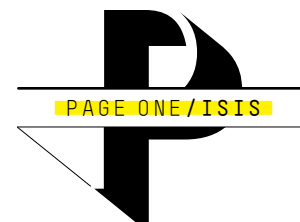
world, keyboard warriors—some on government payrolls, others working on their own time—are trying to degrade and destroy the group's online propaganda efforts, shut down its supporters' social media accounts and expose extremist plots. Hackers and government officials—old adversaries, for the most part—have found themselves fighting a common enemy.

In response to Anonymous's pledge to attack ISIS online, the Islamic militants issued supporters a guide on how to avoid being hacked. "Anonymous hackers threatened in [a] new video release that they will carry out a major hack operation on the Islamic State," the statement read. "Idiot," the author added.

Anonymous may be outing pro-ISIS social media accounts, but critics are questioning the effectiveness of operations such as #OpParis. What impact does deleting social media profiles have, they ask, when people with guns are shooting civilians in the streets?

In a paper titled "The ISIS Twitter Census"—published by the Brookings Center for Middle East Policy, a Washington-based research unit—authors J.M. Berger, a nonresident fellow at Brookings, and Jonathon Morgan, a data scientist, found that from September through December 2014 ISIS supporters used at least 46,000 Twitter accounts—more than twice the number Anonymous claims to have helped unplug. A hacker called DigitaShadow, formerly of Anonymous, tells *Newsweek* the attempts by Anonymous to delete ISIS-linked social media accounts and websites are not particularly effective when the group can still carry out attacks in real life.

DigitaShadow, who declined to give his real name for security reasons, describes himself as the executive director of Ghost Security Group. Speaking by phone, DigitaShadow says he is an American who previously worked in computer security. Ghost Security Group, he says, was founded on January 10 and now comprises 14 members who are focused on foiling ISIS attacks, as well as exposing the Twitter accounts of ISIS allies and fanboys. Ghost Security Group claims to have uncovered plans for assaults in New York, Tunisia and Saudi Arabia. The Tunisia and New York attacks were planned for July of this year, the former to hit a crowded market, the latter, Times Square, DigitaShadow says. The aborted Saudi Arabia attacks, which eventually led to hundreds of arrests, were aimed at various mosques, he adds.



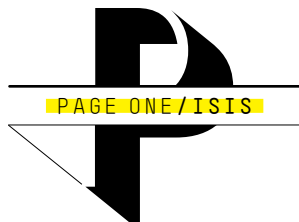
It is impossible to verify many of the claims hacktivists—including Ghost Security Group—make. The Saudi arrests did happen, for example; less certain is whether Ghost Security Group had anything to do with the sweep. The FBI did not respond to *Newsweek*'s requests for comment on whether it has used the group's information, but Michael Smith, co-founder of Kronos Advisory, a U.S.-based global security consulting company, says he has passed on information that the group has given him to law enforcement officials. Ghost Security Group contacted Smith, who has served as an adviser to members of the U.S. Congress, after reading about him in newspapers. Smith and DigitaShadow say the hacktivists' attempts to submit information to the FBI tips line have failed—possibly because of the sheer volume of messages the agency receives.

Smith, who had direct contact with law enforcement officials, showed *Newsweek* corre-

HACKERS AND GOVERNMENT OFFICIALS— OLD ADVERSARIES, FOR THE MOST PART—HAVE FOUND THEMSELVES FIGHTING A COMMON ENEMY.

spondence from one in which the official thanks Smith for passing on information that helped lead to the arrests of would-be attackers in Tunisia. Smith says he received that intel from Ghost Security Group.

Experts in computer security say the online war against jihadis may ultimately be most valuable in countering radicalization efforts by ISIS and other groups. The need for this became clear after the Paris attacks. French security officials believe that not all of the suspected gunmen traveled to Syria. The men might have been radicalized online, like so many before them. One



of them was himself active in spreading online propaganda. The apparent organizer of the attacks, Abdelhamid Abaaoud, was a known ISIS recruiter who was featured in the group's online Dabiq magazine and in various propaganda videos. Preventing the recruitment efforts of men like Abaaoud by shutting down online communication channels is vital in the fight against ISIS, says Calum Jeffray, a research fellow at the Royal United Services Institute, a London-based defense and security think tank.

It is not just online vigilantes like Anonymous and Ghost Security Group that are battling ISIS. In a bid to stop more people from joining the nearly 30,000 foreign fighters estimated to have gone to Iraq and Syria since 2011, government intelligence officials in the West are trying to counter the group's online presence. On November 17, the U.K.'s finance minister, George Osborne, announced that he would double investment in online security to \$2.9 billion in the hope of preventing online attacks against the U.K.

The U.S. government has also joined the online fight against ISIS. In December 2013, the State Department initiated a social media campaign on Twitter called "Think Again Turn Away." This was broadened with a Facebook account in August 2014.

The campaign attempts to counter radicalization with a steady stream of information and videos that claim to reveal the truth behind ISIS's idealized depictions of its own rule.

Despite these efforts, governments and hackers have not yet managed to stop ISIS from using the Internet as a key tool of modern jihad. Some supporters have moved on from Twitter, switching to sophisticated forms of encrypted communication to help them evade intelligence agencies. (Encryption is a form of computer coding that makes communications inaccessible to anyone who hasn't been granted access.)

Like other militant and criminal organizations, ISIS favors messaging apps like WhatsApp, Viber and Telegram—whose founder, Pavel Durov,

also created the Russian social networking site VK—because they use sophisticated, end-to-end encryption, says Jeffray. That form of encryption creates an automatic protective shield around all messages sent via those apps. This prevents the app's creators, owners and developers from decrypting the messages and handing them to investigators, even if courts order them to do so.

Other ISIS members have gone underground into the Internet's dark Web—a murky world of often illegal sites that can be accessed only using specialist software, such as Tor, which enables anonymous communication by bouncing a user's communication around a volunteer-run network of relays so the message can't be traced back to its source.

Some ISIS militants are going on the offensive online. In August, a group called the Islamic State Hacking Division leaked the alleged details of 1,400 U.S. military and government employees online, calling on ISIS supporters to physically attack them. On November 18, the Twitter account for Anonymous's #OpParis announced that its servers were under attack, possibly from the group.

Though the complicated war against ISIS shows little sign of abating, there may be some cause for optimism in the online battle against

LIKE OTHER MILITANT AND CRIMINAL ORGANIZATIONS, ISIS FAVORS MESSAGING APPS LIKE WHATSAPP, VIBER AND TELEGRAM.

the militants. In their paper, Berger and Morgan found that between September and December 2014 there was a decrease in the group's Twitter activity due to the site's administrators suspending at least 1,000 accounts belonging to ISIS supporters. Given Anonymous's claims that it has helped suspend even more, this decline may continue, lessening the amount of ISIS propaganda luring supporters. And on November 18, Telegram announced on its website that it had blocked 78 pro-ISIS channels—public communication streams that broadcast to dozens of followers—since the Paris attacks. In the information war—if not the war of bombs, bullets and beheadings—the West might at least be making some meager progress. **N**



Much, Much Higher Education

STANFORD IS HARD TO GET INTO, BUT IT'S A PUSHOVER COMPARED TO NASA

"Honestly, I'm sort of in shock," Stanford's dean of undergraduate admissions, Richard H. Shaw, told *The New York Times* in the spring of 2014. The university had just admitted 2,138 students out of a record 42,167 applicants for its class of 2018, an acceptance rate of 5.07 percent. At the time, the rate was the lowest in the school's history and the lowest in the country, surpassing the usual titleholder, Harvard, for the second year in a row.

So what would Shaw say about a program nearly 40 times more difficult to get into than

Stanford? NASA recently announced its next call for astronauts—it will accept applications beginning December 14 until February of next year—and its recruitment process makes the most competitive colleges look downright lax.

The agency received 6,113 applications from November 15, 2011, to January 27, 2012, according to Patrick Forrester, a veteran astronaut and deputy chief of the astronaut office at the Johnson Space Center in Houston. Only eight people, four men and four women, were selected—just 0.13 percent of applicants.

Once applicants meet some minimum requirements, Forrester says, panelists in areas like biology, aviation and education narrow the pool down to roughly 400 "highly qualified" candidates and send out requests for references. After another round of cuts, 100 to 120 candidates go to Houston for a week for an interview, medical testing and team-building exercises. That group is whittled down to about 50, of which a handful become the next astronaut class and undergo two years of intensive training. For the upcoming class, to

be announced in June 2017, the agency will need an estimated eight to 14 new astronauts, a NASA spokeswoman says.

"We turn away as many good astronaut candidates as we select," says Forrester, who applied more than once before he even got an interview. "Even if you did everything right, the rate of selection is so low." On the flip side, for those few who are selected, "I wanted them to know that they are very fortunate to be sitting there," he says. "It's no time to start resting."

BY
STAV ZIV
@stavziv

SOURCES: NASA, STANFORD, U.S. NEWS & WORLD REPORT

Paris After the Terror

CIVIL LIBERTIES IN FRANCE WILL NEVER BE THE SAME

I WAS ON on a train to London when I heard the news of the November 13 attacks in Paris, my home. It was startling and heartbreaking, but not altogether surprising. And that's not because I'm a Cassandra: Most people in my circles in Paris have felt for months that an attack was imminent. It was a matter of not if but when.

I am American-born, British-raised and half-Italian, but French by nationality. The day I got my French passport, I realized I was part of a society that above all valued liberty and freedom of expression. After these attacks, that will change: Civil liberties in France will never be the same. There will be heightened surveillance against targeted individuals, which will raise questions about discrimination and the encroachment on individual rights.

Paris has been my sanctuary after reporting for *Newsweek* from Syria, Egypt, Tunisia, Lebanon, Iraq and Afghanistan. Even after the *Charlie Hebdo* attacks last January, I always felt safe here. It is a city where you could take the Métro at midnight; where once

people accept you, you find deep and lasting friendships.

But there are layers to Paris deep below the city's beauty. Having worked on stories about the Muslim integration in Europe, I was well aware of the fact that France lagged behind in terms of assimilation. I reported on the 2005 riots in Paris, and I listened to the voices of young French Muslims who felt they were alienated and had no future, no hope.

In 2004, when my son was born, I wanted to name him Lounès, after a gifted Algerian singer, Lounès Matoub, who was assassinated in 1998. But the Franco-Algerian War and the history of French colonialism is a

tender topic. A French friend warned me, gently, that it might not be wise to give my offspring an Arabic first name.

Then, I did not understand. But the longer I lived in France, the more I saw two faces: the disenfranchised Muslim and African youth, who found it impossible to penetrate society, and the white, quiet quartier where I live.

The killers this time did not target glitzy Paris. They targeted ordinary people out for a night of fun: at a football match, a hip Asian restaurant and a youthful club where for many years I loved to go and listen to music.

My concerns, as a French citizen, are for the future. How do we go

forward when war can suddenly come to your city? Aside from personal worry—my son's school being targeted, taking the Métro without feeling vulnerable—I worry about the extreme right wing that already has gained a foothold in France. These attacks will make Marine Le Pen and her National Front party even more popular and powerful.

Paris is grieving, but it is proud. It will recover. My concerns are larger. The attackers didn't just murder about 130 people and injure more than 350. They also exposed a vulnerability that will force Europe to be more vigilant, and France, I fear, to make concessions on its cherished *liberté*. **N**

BY
JANINE
DI GIOVANNI
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Names in the News

UP, DOWN AND SIDEWAYS

 @WisdomWatch



TED CRUZ

 After Obama criticizes him during trip to Philippines for not wanting to take Syrian refugees, presidential hopeful Cruz tells POTUS to “come back and insult me to my face,” and implies Obama was hiding overseas and wants to accept foreigners because he doesn’t like real Americans. No, Ted, he just doesn’t like you.

OCTOBER

 Hottest 10th month ever recorded, but congressional GOPers still see no evidence of global warming. Probably because oil company boardrooms still at a pleasant, climate-controlled 66 degrees.



ANCIENT EGYPT

 New *Gods of Egypt* trailer has many white guys in industrial-strength eyeliner. Not first movie miscasting of Egypt. On scale of Charlton Heston to Christian Bale, it’s between Liz Taylor and Sigourney Weaver.



CATS

 Unimpressed with foreign policy discussions at G-20 summit, cats take stage. John McCain criticizes Obama for letting them scamper where U.S. interests are at stake, while Putin smugly cuddles one.




LAD MAGS

 You can’t read *FHM* and *Zoo* anymore (even for the articles). *Playboy* has already announced it will no longer feature nude models. In just a few short months, a great literary genre has been rubbed out.



FACEBOOK

 Will finally make your dreaded ex disappear from your newsfeed. Changing your relationship status just got much easier. “It’s not you; it’s me” can now quickly become “It’s just me, all the time.”





SUSTAINABILITY & HEALTHCARE: NEW HORIZONS BEYOND OIL

The UAE's strategy based on diversification and high technology is sustaining economic growth

While other oil-producing countries are struggling to cope with the fall in oil prices, investments in diversification over the course of the past four decades have cushioned the United Arab Emirates from the worst of the fallout. Decisions made by the UAE leadership to use hydrocarbon revenues to develop new, high technology sectors have successfully positioned the country as the most resilient, diversified and innovative economy in the region.

"We have been able to absorb and mitigate the impact of the fall in oil prices, because of the vision set out decades ago by our leadership to diversify our economy," Minister of State Dr. Sultan Ahmed Al Jaber explains. "We will continue to seek opportunities to diversify our economy. It has always been and will continue to be our priority."

According to the International Monetary Fund, the non-oil parts

of the economy expanded by 4.8 percent in 2014, faster than the 4 percent growth of the country's oil industry. The IMF expects the gap to widen in the future, as the UAE's diversified industries continue to outperform; in 2020, the IMF forecasts that non-oil GDP will rise by 4.6 percent, compared to just 2 percent for oil GDP.

“For the past four decades commitment, dedication and long term visionary planning has been our drive. Innovation, sustainability and human capital is the pyramid of the unprecedented development in the UAE.”

Dr. Sultan Ahmed Al Jaber, UAE Minister of State & Masdar Chairman

The private sector and foreign investors are playing an increasing part in the growth of the non-oil economy, especially in strategic

areas such as aerospace, metals, healthcare and clean energy. In 2014, foreign direct investment in the UAE increased by 25 percent to over \$13 billion. The country is also developing a new law on FDI, which will allow 100 percent foreign ownership for the first time outside of the more than thirty free zones across the country. More than 500 foreign companies have already chosen the UAE as their regional base, and the overall volume of foreign investment over the last decade totals in excess of \$100 billion.

These investors have helped to introduce the latest technologies in the country and to develop the UAE into an innovative, knowledge-based society which is focused on sustainable economic growth. "We have had great success with Public-Private Partnerships," says Saeed Mohammed Al Tayer, the Managing Director and Chief Executive Officer of the Dubai Electricity and Water

Authority (DEWA). "We believe that partnerships with the private sector will be key for Dubai's green development."

In its National Innovation Strategy, the Government recognizes that innovation and technology will play a critical part in the growth of the economy in a post-oil world. "We are preparing for the end of oil by investing in building human capital that can innovate and contribute to the world," Minister for Energy Suhail Al Mazrouei says.

The UAE has declared 2015 as the Year of Innovation. "Innovation is a key component of our approach to economic diversification and development," Dr. Sultan Al Jaber says. "Our innovation strategy aims to make the UAE among the most innovative nations in the world within seven years, focusing on seven key sectors: renewable energy, transport, education, healthcare, technology, water and space."

Leaders in innovation, sustainability and healthcare from left to right: President of the UAE, Sheikh Khalifa bin Zayed bin Sultan Al Nahyan, Sheikh Mansour Bin Zayed Al Nahyan, Deputy PM UAE & Minister of Presidential Affairs, General Sheikh Mohammed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi, Sheikh Mohammed bin Rashid Al Maktoum, Vice President, Prime Minister (UAE), & Ruler of Dubai, Dr. Amer Sharif, Managing Director - DHCC Education, **2nd Row:** Masood M. Sharih Mahmood - CEO of Yahsat, Noora Al-Kaabi - CEO of twofour54, **3rd Row:** Moritz Hartmann, Middle East General Manager Roche Diagnostics, Dr. Sultan Ahmed Al Jaber UAE Minister of State & Chairman of Masdar, Dr. Amina Al Rustamani, CEO of TECOM Group, Adnan Aziz, Director General International Renewable Energy Agency (IRENA), Dr. B.R. Shetty, CEO of NMC



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THE CUTTING EDGE OF RENEWABLE INNOVATION

Masdar's investments in clean energy development are helping to transform the economy

Over the course of the past decade, Masdar has grown into one of leading drivers of Abu Dhabi's economic diversification, powering its emergence as a global leader in renewable energy. Since its establishment in 2006, the company has positioned the Emirate on the front line of clean energy research and technology, delivering some 1 GW of renewable power projects around the world.

“By investing in and developing renewable energy projects domestically and internationally, we are extending our leadership beyond hydrocarbons.”

Dr. Sultan Ahmed Al Jaber, UAE Minister of State, Chairman of Masdar

A subsidiary of the government-owned Mubadala Development Company, Masdar has helped develop both the world's largest offshore wind farm – the 630 MW London Array in the Thames Estuary, UK – and the biggest Concentrated Solar Power (CSP) plant, the 100 MW Shams 1 facility in the Western Region of Abu Dhabi.

“Investments like these contribute to Abu Dhabi's leadership in the future energy field as we continue to diversify our economy beyond oil,” says Dr. Sultan Ahmed Al Jaber, UAE Minister of State and Chairman of Masdar.



A view of the Knowledge Centre at the Masdar Institute Campus.

As well as investing over \$1.7 billion in renewable energy projects across the globe, Masdar is also leading the way in developing new technologies for energy efficiency, and carbon capture usage and storage (CCUS), which will help reduce the Emirate's greenhouse gas emissions. The company is developing one of the world's most ambitious CCUS projects through a joint venture between Masdar and the Abu Dhabi National Oil Company (ADNOC). The project will capture 800,000 tonnes of carbon dioxide emitted by an industrial steel mill, and then transport it by pipeline for injection into Abu Dhabi's oil and gas reservoirs.

Simultaneously, another Masdar subsidiary is building one of the world's most sustainable cities, Masdar City, which sources almost all its power from renewable energy. Located 17 km from downtown

Abu Dhabi, Masdar City is a special economic zone and pedestrian-friendly urban development where current and future renewable energy and clean technologies are being showcased, researched, tested, and implemented. The site is already home to leading high-technology multinationals such as GE, Siemens, Mitsubishi and Lockheed Martin. Appropriately, it is also the headquarters of the International Renewable Energy Agency (IRENA).

“Masdar City is a greenprint of a sustainable modern city that combines the best practices of modern technology with the best traditions of architecture,” Adnan Aziz, the Director General of IRENA says. Masdar City is using design innovations to show how the world's cities can accommodate ever increasing urban populations while consuming lower amounts of resources, such as water and energy.

At the centre of the city, the Masdar Institute of Science and Technology is training the UAE's future energy leaders in new specialised skills, and pushing the boundaries of technological innovation and R&D in sustainability.

“Our mission is to contribute to the development of the intellectual capital of the UAE and to position Abu Dhabi as a knowledge hub,” says Dr. Fred Moavenzadeh, President of the Masdar Institute. Of the nearly 500 students, around half are UAE nationals and over 40% are women.

“Our focus is on establishing a knowledge-driven economy, which will require a strong human capital

“Masdar City is an iconic investment and a critical testing ground for the future of sustainability in the region.”

Adnan Aziz, Director General IRENA, International Renewable Energy Agency

base to grow the various sectors in which we are heavily investing,” says Dr. Al Jaber. “Masdar Institute is playing a critical role in educating and shaping the human capital that will contribute to the growth of the renewable energy and clean technology sectors, both in Abu Dhabi and beyond.”



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DIVERSIFICATION KEY TO SUSTAINABILITY

The UAE is a leading investor in renewable energy at home and abroad

Q&A



DR. SULTAN AHMED AL JABER
UAE Minister of State & Chairman of Masdar

Q: What do you believe is the role of education in supporting economic diversification and growth?

A: There is a critical link between economic growth and investing in human capital. Our sustained development, overall success and ability to continue being viewed as a regional energy leader is dependent upon developing a highly skilled, highly productive workforce.

We are developing a new generation of internationally capable energy leaders, able to address and solve pressing energy and sustainability challenges. The Masdar Institute is training the UAE's future energy leaders with specialised skills for an evolving economy, and pushing the boundaries of technological innovation and R&D.

Q: How important is innovation to the future economic development of the UAE? What is Masdar doing to encourage and stimulate innovation?

A: Innovation is deeply important to and a key component of our approach to economic diversification and development. In fact, the UAE leadership launched the National Innovation Strategy in October of last year and our President proclaimed 2015 as the year of innovation in the UAE.

The strategy aims to make the UAE among the most innovative nations in the world within seven years; it will focus on seven sectors the leadership has deemed important to excellence and our overall success: renewable energy, transport, education, healthcare, technology, water and space.

For instance, the team at Masdar, in collaboration with the Masdar Institute, are advancing CCUS technology to increase hydrocarbon production while reducing carbon emissions. They are also researching how to combine renewable energy and cutting-edge desalination technologies to create commercially viable ways to meet long-term water security.

Through Masdar, we are also making an impact in the renewable energy space – from the Shams 1 solar power plant in Abu Dhabi, to the London Array in the United Kingdom, which are two of the world's largest

and most sophisticated renewable energy projects

Q: As a member of the UN High Level Group on Sustainable Energy for All, and a Champion of the Earth, what plans do you have for deploying the UAE's renewable energy know-how in the world's poorer countries?

A: We have done a great job of partnering with other governments to install world-class renewable energy projects in their countries, as well as sharing lessons learned and best practices to support and encourage their adoption of clean energy. For example:

- In the Hashemite Kingdom of Jordan, Masdar is developing the Tafila wind farm, the first utility-scale renewable energy project in the country. This 117MW facility will power more than 80,000 homes.

“The Masdar Initiative's contribution to the UAE's economic development and success lies in research. We have five priority areas: water, innovation, energy, microsystems and smart & sustainable systems.”

- In the Seychelles, Masdar has developed and delivered the first large-scale renewable energy project that produces nearly 7 gigawatt hours of clean energy per year.

- In Afghanistan, Masdar installed solar home systems in more than two dozen villages in Helmand

Province, which is enhancing the lives of more than 3,000 people who previously had no access to electricity.

Lastly, the UAE-Pacific Partnership Fund, a \$50 million initiative, is developing grant-funded renewable energy projects, which Masdar is implementing in the region. So far, we have delivered projects in Tonga, Samoa, Kiribati, Fiji and Tuvalu.

Q: The UAE is the headquarters of IRENA. How and why is the UAE taking the lead in developing the renewable energy industry in the Middle East?

A: It was the vision of our late founding father Sheikh Zayed bin Sultan Al Nahyan to diversify the UAE's economy beyond hydrocarbons. With the unwavering support of our leadership, we were able to launch Masdar and show the world we are serious about diversifying our energy mix – and we have done just that for the past few years. In 1970, non-oil sectors represented just 5 percent of our GDP; today, they represent nearly 70 percent. However, it is not enough to be the first Arab country in the region to produce renewable energy. We need to maintain our energy leadership now and for decades to come, and help contribute to diversifying the global energy mix to ensure long-term, sustainable energy security.



Although it is one of the world's largest producers of fossil fuels, the UAE is also a world leader in renewable energy research, development and deployment. At the end of October, ahead of the COP21 UN Conference

on Climate Change in Paris, the UAE submitted its climate action plan to the United Nations, which includes an ambitious target to achieve a 24 percent clean energy mix by 2021. In addition to increasing its supply of renewable energy, the UAE is also undertaking comprehensive policies to reduce energy demand, such as increasing electricity tariffs for commercial and industrial

users and developing standards for buildings and energy efficiency. The Paris climate conference aims to reach a global agreement to curb the threat of climate change, which will come into effect in 2020. It is expected to stimulate global demand for the products and services of the UAE's fast growing renewable energy industry. “Our leadership recognises that climate action can simultaneously create

economic opportunity and protect the environment,” Dr. Sultan Ahmed Al Jaber said when submitting the plan to the UN. “Each nation has a tremendous opportunity to seize the positive economic and social returns of climate action and to help transition the global economy toward a sustainable, enduring, economic future.”

NEW INDUSTRIES RISE FROM THE DESERT

Free trade zones and investments in innovation are driving economic diversification

The goal of the National Innovation Strategy published by the Government of the UAE at the end of 2014 is to establish the country among the world's most innovative nations by 2021. To achieve this ambition, the Government is investing heavily in developing world-class infrastructure for high technology

“We are planning to open an innovation hub in the UAE where we will bring together people, start-ups, entrepreneurs and new ideas.”

Rabih Dabboussi, Managing Director, Cisco UAE

companies of all sizes, from giant multinationals bringing expertise from overseas to local start-ups and entrepreneurs developing businesses in industries based not on oil but on knowledge.

“In 50 years, when we might have the last barrel of oil, the question is: when it is shipped abroad, will we be sad? If we are investing today in the right sectors, I can tell you we will celebrate at that moment,” H.H. Mohammed bin Zayed bin Sultan Al Nahyan, Crown Prince of Abu Dhabi, said at a Government Summit in January.

Across the Emirates, a series of free trade zones are spearheading the diversification effort. At Masdar

City, investors can operate with 100 percent foreign ownership, without the need for a local partner. They can move their capital and profits abroad without restrictions, are not subject to import tariffs, corporate taxes, individual taxes, or currency limits, and benefit from a strong framework of intellectual property protection. Like other free zones in the UAE, Masdar City also offers businesses a one-stop platform for opening a business, with services including company registration, office leasing and fast-track visa processing. In total, the development has the potential to host 40,000 residents and 50,000 commuters by 2025.

Located close to Abu Dhabi International Airport and developed by Mubadala, Masdar City is focused above all on attracting innovative, high-technology investors and on supporting entrepreneurs and start-ups. Its Incubator Building is a state-of-the-art hub for innovation, offering office space ranging from a single desk to 1000 square meters, on a site that lies adjacent to the Masdar Institute of Science and Technology and to the award-winning Siemens Building. The flexible floor options of the Incubator Building provide start-ups and SMEs with the flexibility to configure their space to suit their needs. Combined with the arrival of leading multinationals, this has resulted



Regional investment in solar, wind & nuclear is expected to reach \$100 billion over the next five years.

in an emerging technology cluster at Masdar City, where companies are pushing the boundaries of innovation, especially in the clean technology and renewable energy sectors. “Innovation is in part what drives and fuels societies – from the industrial revolution to today’s technological revolution,” Sultan Al Jaber says. “Mubadala is ensuring that each of its businesses are innovating and pushing the boundaries of technology, in particular through Masdar.”

In neighbouring Dubai, the Dubai Media City and Dubai Internet City business parks developed by Tecom Investments have already positioned Dubai as a leading global player in these high technology sectors. At the fast-growing Dubai Design District (D3) free zone, Tecom is now developing a state-of-the-art smart city project that will provide creative and innovative businesses with world-beating infrastructure and

services. “Tecom’s ultimate purpose is to develop the creative industries in our city,” Tecom Group CEO Dr. Amina Al Rustamani says. “It is an exciting process.”

“We have a strong culture of entrepreneurship, from small family run businesses right up to large corporations.”

Dr. Amina Al Rustamani
CEO, Tecom Group

Tecom’s partner in its smart city initiative, networking giant Cisco, is confident that the Emirates have what it takes to rise to the challenges of diversification and innovation. Rabih Dabboussi, the company’s Managing Director in the UAE says that “the buzz, the momentum, the acceleration, the investment, and the top leadership vision of transforming every aspect of life all give us an amazing platform on which to build.”

LOCAL UTILITY STEPS UP TO THE CHALLENGE OF RAPID GROWTH

As Abu Dhabi’s population grows and its economy powers ahead, the Emirate’s public utilities are investing heavily to ensure that the country’s physical infrastructure can cope with continuously rising demand. One flagship investment project, the Strategic Tunnel Enhancement Programme (STEP), is now nearing completion after more than five

years of construction. Managed by the Abu Dhabi Sewerage Services Company (ADSSC), STEP will provide Abu Dhabi with the sewerage and wastewater network it will need to serve a population that is expected to rise to three million people by 2030. From early next year, a 41 kilometres sewage tunnel deep underground will use the power of gravity to transport sewage water from Abu

Dhabi Island and surrounding areas to a new underground pumping station on the mainland, where it will then be pumped to treatment plants. The system will

“By using a deep gravity tunnel we have been able to build a structure that is virtually maintenance-free”

Alan Thomson
ADSSC, Managing Director

deliver a massive increase in capacity, and will allow ADSSC to switch off its current network of 34 ageing pumping stations, improving the company’s energy efficiency and decreasing its emissions of greenhouse gases. “The new pumping station will consume much less power than the 34 that we are replacing,” ADSSC Managing Director Alan Thomson says.

PRIVATE PROVIDERS FUEL REVOLUTION IN HEALTHCARE

International healthcare companies are investing in a rapidly expanding market

One of the fastest growing areas of the UAE's non-oil economy is the healthcare sector. As the population continues to increase and lifestyles evolve, demand for healthcare is rising across all segments of the market and in both the public and private systems. At the same time, rising investment by local and foreign providers, especially in Dubai, is transforming the country into a regional hub for medical tourism.

Following Abu Dhabi's decision to make health insurance mandatory for expatriates and with Dubai moving towards a universal healthcare insurance scheme, private participation in the healthcare sector is increasing. This is serving to raise quality and introduce new specialty services in the country. As such, private providers are

playing a major part in progressing towards the healthcare targets of UAE's Vision 2021, which include rising to the 20th position in the global healthcare quality index, from the 37th position in 2014.

"The UAE's private sector is the most developed and most prominent in the region," says Mortiz Hartmann, Middle East General Manager for in vitro diagnostics specialists Roche Diagnostics. "The private sector in the UAE now represents more than half of the healthcare market."

Roche Diagnostics chose Dubai as the location for its regional headquarters and logistics center, from where it manages its supply chain, quality control and customer support for 20 countries. The company is the first in vitro diagnostics firm to have a Management Center and a

logistics hub in the Middle East. Hartmann says this enables its leadership and decision-making to be closer to both its customers and its distributors. "Dubai is the ideal business hub for us in the Middle East. As well as the legal

“The healthcare provided here is equal to the care we provide elsewhere in the world. This benchmarks favorably internationally.”

David Hadley
CEO, Mediclinic Middle East

and economic environment, the free zone in Jebel Ali is an excellent facility for a demanding and high quality supply chain like ours. Dubai is also a place where it is possible to find and attract talent; we have more than 380 employees currently across the region and we

will probably reach 500 next year.” Until recently, healthcare in the UAE was funded mainly by the Government. As the country modernizes its health system, public-private partnerships, often with US-based institutions, are now playing an increasing part in funding new hospitals and clinics. Meanwhile, local healthcare providers such as NMC Healthcare have listed on the London Stock Exchange to raise funds and are expanding rapidly across the Emirates, acquiring hospitals and specialty medical centers and building new assets. According to a report from Alpen Capital, over the 2013–2018 period the UAE healthcare market will grow at an annual average rate of 13.1 percent, to \$18.6 billion, and the number of hospital beds will increase to 21,357 from 19,602 in 2013.



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SOPHISTICATED NEW SERVICES

The sector is highly focused on attracting more expatriate healthcare workers

International health companies are delivering much of this increase in capacity. In Dubai, Mediclinic Middle East, part of Mediclinic International, has announced plans to construct a new general hospital, which will be similar in scope to its existing Mediclinic City Hospital in Dubai's free economic zone for healthcare, Dubai Healthcare City. Once finished at the end of 2018, Mediclinic Parkview Hospital will

“The UAE has the latest technology and the know-how to properly diagnose even the most complex diseases.”

Mortiz Hartmann, Middle East General Manager Roche Diagnostics

provide international standard healthcare services to the southern area of Dubai. The hospital will employ more than 800 staff, and have an initial capacity of 150 beds and six operating theatres. “It will be

a multidisciplinary hospital that will bring the same quality of services that we have here in Dubai Healthcare City to the newer side of Dubai,” David Hadley, CEO of Mediclinic Middle East says. “It is our most substantial investment in the UAE healthcare market to date, and is testament to our confidence in the country's economy and continued growth.”

In early 2016, Mediclinic will also open a new wing at its existing Mediclinic City Hospital. The North Wing project will include an oncology unit, a centralised laboratory, some outpatient services, and a new corporate office. As well as providing new services to the UAE, the expansion will free up space in the main hospital, allowing it to create additional capacity of around eighty beds, or over 20 percent. “We have seen significant increases in demand for our services,” Hadley says. “People want the international quality that we bring.”



Mediclinic Middle East owns and operates some of the most respected healthcare facilities in the region.

With sophisticated new services coming into the market, cost pressure in the healthcare market is rising. Medical salaries in particular are increasing at a high pace as the cost of living rises in the UAE and hospitals around the world compete for the best talent. With the Government targeting a 50 percent increase in the number of doctors and nurses per capita by 2021, the sector is highly focused both on attracting more expatriate healthcare workers and on investing in developing local talent.

Roche Diagnostics is also investing heavily in training and developing locals for its operations, creating new, high-value job opportunities for Emiratis. “We provide at least three training sessions to each employee each year,” Mortiz Hartmann says. “It is a significant investment not only financially but also in terms of time.” As well as training employees, the company has also established regional training centers for its customers, including one in Dubai, supported by online training solutions.

DR. B. R. SHETTY A PIONEER IN PRIVATE HEALTHCARE

When Dr B. R. Shetty was growing up in the outskirts of Udipi, a small town in the Indian state of Karnataka, his dream was to become a pilot. But because his parents always emphasised the value of a good education, Shetty wound up with a degree in pharmacology.

Like every decision in his life, his reasons for moving to Abu Dhabi were selfless. He had borrowed money to pay for his

sister's wedding and he needed to repay the loan.

It was 1973, and Dr. Shetty had heard that the Gulf countries were starting to develop on account of their vast oil reserves. He envisioned that there would be a growing need for basics such as healthcare. So, with the blessings of his parents, he boarded a flight to the UAE. He had the equivalent of \$8 in his pocket, and just the clothes he wore.

He went from door to door selling pharmaceuticals. That led to opening his own pharmacy, and that, in turn, led to the opening of his own hospital. “I saw opportunities where others didn't,” he says. As the first pharmaceutical sales representative in the UAE, he began instructing local doctors, showing them how to better store medicines and improve the quality of their service toward everyday patients.

Today, four decades later, Dr. Shetty presides over a multi-billion-dollar healthcare system that is rated among the best in the world. He has been named by leading publications as among the wealthiest self-made men in the Middle East. NMC is listed on the FTSE 250 Index on the London Stock Exchange.

“It is your duty to give back to society. Only when you share your success does it multiply.”

Dr B.R. Shetty
CEO, New Medical Centre Group

Apart from NMC which owns and operates hospitals in the UAE, Spain and Colombia, Dr. B.R. Shetty also owns hospitals in Egypt, Nepal and India. He owns the world's biggest forex and remittance group - consisting of Travelex and UAE Exchange - and he runs schools and philanthropic

programmes. He emphasises the importance of promoting better healthcare for women and children and he will soon launch the first medical school in the UAE. He will also be further expanding the footprint of healthcare services across Europe, Egypt, and, of course, his native India.

He is a devout believer in what he preaches: Prevention is better than cure. It is a mantra with him, not some platitude. Dr. Shetty frequently visits patients at his hospitals to check how they are being treated. His 900 physicians are from over 40 nations, and they come to NMC through word of mouth.

He strongly believes, “We are not just doing business to make money, we are building stronger societies whose citizens contribute effectively to social and economic development.”



Patient care is a priority in the UAE.

INFRASTRUCTURE AND QUALITY POWER MEDICAL TOURISM

New healthcare facilities and rising standards are driving rapid growth in the market

Investments in new healthcare infrastructure and services in the UAE have transformed the country into the leading health tourism destination in the region. As the Government and regulators tighten standards and as new international providers move in, the healthcare system in the Emirates is becoming increasingly competitive with healthcare in developed markets.

“We are proud to have maintained a high level of satisfaction with Dubai Healthcare City facilities.”

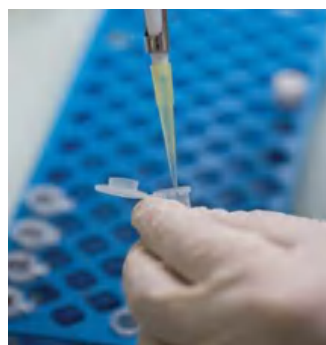
Dr Raja Al Gurg, Vice-Chairperson & Executive Director, Dubai Healthcare City Authority

“People travel for medical tourism for three reasons – lack of access to healthcare, price, and quality,” David Hadley at Mediclinic Middle East says. “While the UAE cannot compete with countries such as India and Thailand on price, because salaries here are higher, the country has facilities that are not available in other parts of the region and it also has a growing reputation for quality.”

According to Alpen Capital, the UAE medical tourism sector

is growing strongly, and reached a value of \$1.69 billion in 2013. Dubai Healthcare City (DHCC) is driving much of this growth; in 2014, medical tourists represented 15 percent of the total number of patients seeking treatment. A DHCC-commissioned survey last year found that 48 percent of its medical tourists come primarily from the GCC; 32 percent from the wider Arab World; 26 percent from Eastern and Western Europe; and 23 percent from Asia. The three most popular procedures are infertility treatments, cosmetic treatments, and dental work. DHCC-based physicians said that 80 percent of medical tourists come to Dubai for its quality of care, 61 percent cited the city’s experienced physicians, and 48 percent highlighted the availability of specialist treatments. According to Alpen Capital, in addition to the high quality of healthcare in Dubai, medical tourists can achieve cost savings of 20 to 40 percent compared with the U.S. and Europe.

The continued expansion of the DHCC is poised to bring ever rising numbers of foreign patients to the Emirates for an increasing range of treatments. In 2014, nine new medical institutions established a



The UAE is now a healthcare hub for the region.

presence in DHCC, including clinics for fetal and maternal health, for child and adolescent mental health, and for digestive health and endoscopy. In the first half of 2015, ten clinical facilities started operating, including clinics focused on areas such as diet, dentistry and sleep disorders. In March this year, Sheikh Mohammed bin Rashid Al Maktoum launched the \$800 million to \$1.4 billion second phase of DHCC, which will see new medical and health centers constructed over a land area totaling 22 million square feet, as well as hospitality and retail sites which will cater to visitors from overseas.

At the same time, the UAE is making a continuous effort to enhance the quality of its healthcare services and strengthen its international reputation. By 2020,

only accredited healthcare providers will be allowed to operate in the country. As part of this process, the DHCC’s Centre for Healthcare Planning and Quality (CPQ), which is responsible for the regulation and licensure of all healthcare facilities and practitioners within DHCC, won accreditation from the International Society for Quality in Healthcare (ISQua) for its Outpatient Clinic Quality Standards. ISQua is the only international organization to ‘accredit the accreditors.’ Its decision to accredit the Dubai-based body confirms that DHCC’s standards meet international best practice, and will consolidate DHCC’s position in the medical tourism market. Ramadan Ibrahim, Director of DHCC’s regulatory department, expects the total number of tourists to rise to 500,000 by 2020 from 170,000 in 2016. To achieve this growth, the UAE has relaxed conditions on visas for medical visits and has launched innovative medical tourism packages which bundle hotels and flights with a range of treatments, including orthopaedic and sports medicine, plastic surgery, ophthalmology, dental procedures, dermatology and preventive health check-ups.

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THE POWER OF KNOWING

PUTIN'S BLOODY LOGIC IN SYRIA

ISIS is pushing the
West to embrace the
Kremlin's plan to end
the Syrian civil war

By Owen Matthews
With Jonathan Broder
in Washington





“TO FORGIVE THE TERRORISTS IS UP TO GOD,”

was Russian President Vladimir Putin’s characteristically blunt comment on the Paris attacks. “But to send them to him is up to me.” His practical response was no less blunt. The Russian air force kicked up the frequency of its airstrikes on ISIS positions in Syria to over 120 sorties a day and began using long-range Tu-95 strategic bombers, designed to carry nuclear payloads, to drop cruise missiles. The raids destroyed at least 500 trucks carrying smuggled oil—ISIS’s financial lifeblood—as well as training camps, according to Russian Colonel General Andrei



Kartapolov. And for the first time, the bombing was coordinated, on a basic level at least, with France and the U.S.

And so ISIS’s attacks on Paris and on a Russian airliner in Egypt have succeeded where two months of talks have failed in uniting the old World War II allies against a common enemy. Even U.S. Secretary of State John Kerry seemed to acknowledge Russia’s dramatic military and diplomatic intervention in Syria as a game-changer. He spoke of “a greater level of exchange of information” between Russia and the West, and of his hopes of a cease-fire between the forces of Syrian President Bashar al-Assad and the non-ISIS opposition “within the next three, four, five weeks.

“Iran, Russia [are] ready for a cease-fire. The United States [is] ready for cease-fire,” said Kerry, who was in Paris to pay his respects to victims of the November 13 attacks. “The faster Russia and Iran can give life to [the political] process, the

+

WAR GAMES: Russian state media has filled the airwaves with dramatic footage of airstrikes in Syria, but Western intelligence agencies say the majority of strikes targeted anti-Assad rebels, not ISIS.

faster the violence can taper down.”

Putin’s journey from a pariah to an indispensable Middle East power broker has been startlingly fast—and driven by what looks like growing willingness among some Western powers to overlook the Russian leader’s sins in Ukraine in the interest of destroying ISIS.

Russia’s intervention has already had three dramatic effects. First, it has stopped the retreat of the beleaguered Syrian army and given the Assad regime a massive morale and military boost. Second, Moscow’s full-court press on the diplomatic front has crystallized into a draft peace plan that calls for a cease-fire among all “moderate” opposition groups, while Islamist radicals of ISIS are destroyed, to be followed by nationwide elections (true, it’s a peace plan that so far none of the combatants except the Assad regime support, and in the meantime Washington has stepped up its military support of Syrian Kurds and other rebel groups). And third, Putin’s foray into Syria has already generated grim blowback in the form of the bomb attack on a Russian passenger plane, claimed by ISIS, that killed 224 people.

But what is Russia’s plan for getting from the current chaos to something like victory? And what does a victory look like for Russia?

“The first priority,” says a senior Russian diplomat who works with his country’s Middle East policy, “was saving the [Assad] regime from immediate collapse.” Indeed, says this source, who requested anonymity when discussing his government’s policy-making, the Russian deployment was precipitated by “an urgent visit” by a senior member of the Iranian Revolutionary Guard Corps to Moscow in August, who warned that the Syrian army was crumbling and that government positions would soon be overrun by opposition forces affiliated to the Free Syrian Army. Assad’s troops were falling back along

the key corridor of Syria's M5 roadway linking Damascus to Homs, Hama and northern Syria. Losing that could cut off the coastal heartland of Assad's Alawite sect from the capital. In September, Russian airstrikes against rebel groups in northeastern Syria—according to the U.S., 85 to 90 percent of them hitting “moderate” opposition groups rather than ISIS—stabilized the line. By mid-November, regime troops heavily supported by Russian air force bombers and Russian-made Mi-24 Hind helicopter gunships flown by Syrian pilots were able to break a two-year-long ISIS siege of Kweiris air base in Aleppo province.

Russia's—and the regime's—military strategy hinges on pushing that assault further. “This is all about Aleppo,” says Joshua Landis, a Syria expert and former U.S. government adviser. “Russia is trying to help Assad gain as much territory to create a state that makes sense—that has to include Aleppo, a major port, and Idlib.... The Syrian leadership plans to take Aleppo in three months and in a year consolidate all of northwest Syria.”

But most observers question whether the exhausted Syrian army, even with the backing of Russian air power and Iranian Revolutionary Guards soldiers and senior officers, can capture that much territory so quickly. Especially after so many years of military deadlock that has included desperate military measures by the Syrian army, such as dropping primitive but deadly barrel bombs from helicopters over densely populated areas of Aleppo and deploying sarin nerve gas against civilians in 2012.

Then there's the possibility that backers of the largely Sunni opposition in the region will ramp up their support to match

“WE ARE NOT SAYING THAT ASSAD SHOULD LEAVE OR STAY... BUT WHAT IS UNACCEPTABLE TO US IS GETTING RID OF ASSAD AND REPLACING HIM WITH ANARCHY.”

Russia's. The most likely scenario, says Moscow-based military analyst Pavel Felgenhauer, is a “slow, parallel escalation... If there are more successes by Assad's forces, the opposition will get help maybe in the form of direct intervention by the Turkish and Qatari air forces, or also more sophisticated anti-aircraft weapons such as Stinger or Avenger missiles that the Saudis have purchased from the U.S.” For its strategy of bolstering the Assad regime to succeed militarily, “the Kremlin needs to convince the Qataris, the Saudis and the Turks

not to arm the opposition, and also convince the West that Assad is the man who can restore security and stop the flow of refugees,” says Landis. That will not be easy.

ASSAD OR WHO?

OSTENSIBLY CENTRAL to the diplomatic debate over Russia's new plan is Moscow's apparent insistence that Assad remain in power at least for 18 months while preparations are made for national elections to be held. An October trip by Assad to Moscow was his first known trip outside Syria for four years. He flew on a Russian military plane for a visit that appeared to be a strong personal endorsement of him by Putin.

But what is really important for Russia is keeping



**“WE SAW
THIS IN IRAQ—
IF YOU
DESTROY
THE REGIME,
YOU DESTROY
THE STATE
TOO.”**

the Syrian state intact—and that means preserving the 45-year-old regime founded by Assad’s father, Hafez, and based on the supremacy of the Alawite sect of Islam, a religious minority in its own country. “We are not saying that Assad should leave or stay,” says the Russian diplomat, echoing public statements by foreign ministry spokeswoman Maria Zakharova. “It is up to the Syrian people to decide who rules them.... But what is unacceptable to us is getting rid of Assad and replacing him with anarchy. For the sake of the Syrian people, Russia will not accept another Iraq or Libya.”

Yet Assad is now a toxic figure not only to the Syrian opposition. “A whole bunch of countries, including the United States, Saudi Arabia, the Emirates, Turkey, Qatar, Jordan, Egypt, Great Britain, Germany, France, Italy, most of Europe, dozens of countries, if not hundreds, understand that Assad creates an impossible dynamic for peace,” Kerry told a meeting of states involved in the Syrian crisis in Vienna on October 29.

In practice, though, even prominent U.S. policymakers worry that Moscow is right: Deposing Assad immediately may lead to the collapse of Syria and a bloodbath. “Getting rid of Assad is a code word for scrapping the Alawite ascendancy,” says Landis. “The concept the West has believed in for the last dozen years, that you can have regime change without destroying the state, is not borne out by facts on the ground. We saw this in Iraq—if you destroy the regime, you destroy the state too. Syria is a sectarian regime. All the big institutions—the army, the police—are populated from top to bottom with [Alawite] Assad supporters. If you put a Sunni on top, he would have to fire everyone underneath—not only for revenge but because he couldn’t trust them.”

As early as 2013, when the presence of Islamist extremist groups like the Nusra Front, an Al-Qaeda affiliate, became a major factor on the battlefield, some U.S. officials privately questioned the wisdom of the official U.S. position on removing Assad. A senior congressional official, who spoke on condition of anonymity to discuss sensitive information, confirms that the classified diplomatic cables he saw were “a lot less enthusiastic about the prospect of Assad’s departure and a lot more concerned about who would replace him.” In February 2014, Robert Ford, U.S. President Barack Obama’s ambassador to Syria, resigned in protest over the administration’s policy in that country.

At the same time, Russia acknowledges that in the long term a less divisive figure than Assad may have a better chance of producing a compromise. “There is a difference between the Iranians and the Russians,” Khaled Khoja, president of the opposition Syrian National Council, told supporters before the Vienna conference. “The Russians need to enhance their influence whether Bashar al-Assad is in power or not. The Iranians are sticking with Bashar; they know no one else will give them the same benefits.”

The problem for Moscow is finding a plausible replacement. Both the Russians and the U.S. have been seeking an “Assad Lite” for years. According to Ford, a current leading candidate is Colonel Suheil Hassan, regarded as the Syrian military’s best field commander. Nicknamed *Al Nimr*, Arabic for “the Tiger,” he led the successful offensive on Kweiris air base in November.

The Russians claim that “there are several people in our field of vision, on the political side, on the military side,” according to the Russian diplomat, though he won’t name names. “Our contacts with Syria go back decades. Hafez al-Assad learned to fly MiG fighters in the USSR. All their top officers trained with us. We know them all.”

Veteran Syria hands in the U.S., though, are skeptical of such bluster. “Anyone who thinks that Russia knows Syria better than the U.S. is deluded,” says Landis. “You can’t just go down three positions and find a general who can jump up. They have been purged. They don’t exist.” Landis recalls a conversation with a Syrian brigadier general before the outbreak of the civil war about the prospects of anyone seizing power in Syria—as Hafez al-Assad did in a series of coups and purges in 1963, 1966 and 1971. “The general’s answer was: ‘The top 12 military figures in Syria all believe they could rule better than Assad. But could they stay in power? No.’ The truth is that getting rid of Assad would be seen as a sign of weakness. The hawks in the region would tear down the whole Alawite infrastructure.”

There is no sign that what Landis calls “the very predatory political culture” of Syria’s ruling Alawite sect has softened over the past four years of war. After the fall of four regime military bases in September 2014 and the killing of 250 soldiers at Tabqa air base, Alawites came onto the streets in Homs to demand the resignation of the governor. Faced with this challenge to his authority, Assad dismissed his cousin Hafez Makhoul as head of the internal branch of the General Security Directorate. Makhoul and his brother Ihab were allowed to flee to Belarus with their



BEST FRIENDS FOREVER? Bashar al-Assad flew to Moscow in October for his first known trip abroad since the war started in 2011, but Russian sources say Putin is not wedded to keeping Assad in power indefinitely.

OVER A BARREL: They Syrian Army, which was struggling and in disarray in the summer, has pushed back against ISIS and reclaimed important territory since Russia started airstrikes in September.



families. Then, in April 2015, Assad ordered the arrest of another cousin, Munther al-Assad, for plotting against the regime. Intelligence chief Ali Mamlouk was placed under house arrest soon after, accused of plotting with Bashar al-Assad's exiled uncle Rifaat al-Assad to replace Bashar as president. Several other top military officers have also been reported arrested and liquidated since May, including the commanders of the Syrian army's 1st and 4th Armored Divisions, the chief of one major air base and the head of special forces. It's not known whether the officers were removed for failures in the field or for political crimes. But in any case, argues Landis, Russia's notion of a change of Syrian leadership by peaceful election is pie in the sky. "It's impossible for Alawites to carry out any kind of democratic procedure. That's a false notion of how this tribe works. Without Assad, all top Alawites would kill each other."

SOCIOPATH OR PSYCHOPATH

IF ASSAD IS the only option, what does that mean? Diplomats and journalists who have met him recently report that he seems to be in a state of profound denial. "President Assad and the people around him never doubted they would win," recalls a former U.N. envoy to Syria, Lakhdar Brahimi. "For them, the war was an aggression from outside." In a February interview with the BBC, Assad insisted that "the government and the state institutions are fulfilling their duty towards the Syrian people" and blamed the war on an "invasion of terrorists coming from abroad." He also denied the widely documented use of barrel bombs. Ambassador Ford said he found Assad gracious,

soft-spoken and noticeably free of haughtiness, displaying a sense of humor and even making puns in his fluent English. But he was also quick to anger when pressed on Syria's human rights violations. *Foreign Affairs* magazine's managing editor, Jonathan Tepperman, who interviewed Assad in January, concluded that "either Syria's president is an extremely competent fabulist—in which case he's merely a sociopath—or he actually believes his lies, in which case he's something much more dangerous (like a delusional psychopath)."

Yet in Moscow in October, officials claim they found Assad "calm, lucid, very much in control," according to the Russian diplomatic source. During the visit Assad made important concessions. Crucially, he was told that he must agree to share power—and Russian air support—with moderate opposition groups that Russia could entice into a "counterterrorist coalition" to fight ISIS.

Since Assad's visit, Russian agents have been busy reaching out to his opponents on the ground even as they bomb them from the air. Mustafa Sejjari, a commander of the Free Syrian Army, confirmed in late October that Russia had invited several of his group's leaders for talks. The aim is to find rebel leaders who are willing to make a deal to lay down their arms and participate in elections—while making it clear that groups that refuse the bargain would be mercilessly



BUNKER MENTALITY: Journalist Jonathan Tepperman, who interviewed Assad in January, concluded that he was either “an extremely competent fabulist...or he actually believes his lies.”

pounded by Russian bombs. It’s a strategy that Russia pursued successfully in Chechnya in the early 2000s.

According to diplomatic sources in Moscow, Russia has drawn up a list of 38 potential opposition allies, including three former heads of the Syrian National Council: Hadi Bahra, Ahmad Moaz Khatib and Ahmad Jarba, and its current president, Khoja. Russian Foreign Minister Sergei Lavrov has also backed an 11-point “national project” proposed by defected regime General Manaf Tlass that sets out a roadmap toward a cease-fire and eventually a joint assault on ISIS.

More important, Moscow has also been in regular contact with Assad’s archenemies in the region. Immediately after Assad’s departure, Putin spoke with the major Sunni leaders in the Gulf states and Jordan. Putin has also recently hosted Saudi Arabia’s foreign minister and defense minister in Moscow. In other words, Putin seems keen to present himself as an honest broker to powerful Sunni states he cannot afford to alienate. In particular, Putin has been careful to reassure the Saudis that Russia’s friendship with their main enemy, Iran, is not a new regional alliance. And though Putin traveled to Tehran on November 23, lingering suspicions between Moscow and Tehran run deep: Earlier in November, Major General Mohammad Ali Jafari, head of the Iranian Revolutionary Guard Corps, grumbled that Russia “may not care about Assad staying in power as much as we do.”

Jafari is right. Russia is playing a diplomatic game that extends far beyond Syria. Unlike revolutionary Iran—or even America, with its ill-starred enthusiasm for regime change in the Middle

East—Russia is essentially a status quo power. First and foremost, Moscow wants to preserve its economic and security interests in Syria and prevent the collapse of its last ally in the region. And while Turkey, Saudi Arabia, Jordan and Qatar would ideally like to see Assad gone and Iranians removed from Syria, Putin is hoping that a compromise may be possible. For instance, a scenario in which Russia rather than Iran emerges as the dominant outside power in Syria, with Assad staying on in a ceremonial capacity. That’s the kind of deal the Russians believe that Saudi Arabia and its Sunni allies could live with—though so far Saudi Arabia has stuck to its firm line against Assad staying on.

The problem, warns Mark Galeotti, professor of global affairs at New York University, is that “modern wars tend to start well, with deceptive techno-thriller ease. The preplanned airstrikes, mapped in cockpit camera video.... They quickly tend to degenerate in messy ways that favor the desperate, the unpredictable, the insurgent and the unseen. With the Kremlin’s new adventure in Syria, it is likely soon to find itself losing the initiative and faced with a series of dangerous and unpalatable options.” Specifically, the numerous factions in Syria have been poisoned by the brutality of civil war and are very far from the kind of mutual understanding and forgiveness

FROM LEFT: SASHA MORDOVETS/GETTY; SANA/AP

that underpins any peace process. By Landis's estimate, there are "1,500 militias in Syria, who all want to be ruler."

Russia "believes most Syrians support Assad and that a minority are being oppressed by a small group of foreign-backed militants. They have been told that if you bomb the militants you can declare victory," says Felgenhauer. "They totally misread and misunderstand the situation in the Middle East. They do not understand what they are doing."

'WE WERE FEARED'

BUT THERE'S some deep background to Putin's swaggering belief that carefully applied ultraviolence can put the Middle East to rights. When four Russian diplomats were kidnapped by a team of masked gunmen as they drove out of the Soviet Embassy in Beirut on September 30, 1985, the USSR didn't bother with negotiations. The kidnappers were affiliated with the Iranian-backed group Hezbollah, so Colonel Yuri Perflyev, the KGB's *rezident*, or station chief, in Beirut immediately sought out Grand Ayatollah Muhammad Fadlallah, the spiritual leader of Lebanon's Shiites. How unfortunate it would be if a Soviet nuclear missile happened to land on the Ayatollah Khomeini's residence in Tehran, or on the Iranian holy city of Qom, Perflyev told the ayatollah. "The patience of a great power can run out," Perflyev said, according to an account of the events he gave to Russian TV in 2001. "From waiting and observing, [the USSR] can proceed to serious action with unpredictable consequences."

"Fadlallah was left wondering, Are these crazy Russians really *that* crazy, to drop a bomb on Qom," recalls the Russian diplomatic source. "And then he thought, Wow, maybe they really are." Soon after, a commando team from the KGB's elite Alpha Force arrived in Beirut. They tracked down a close relative of the hostage takers' leader, Imad "the Hyena" Mughniyeh, and kidnapped him, castrated him, then shot him in the head. Then the Soviets sent his severed body parts to Hezbollah headquar-

**"THEY WERE
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USSR."**

ters, with a message that other relatives would be next.

"The kidnappers made a mistake," says the diplomat. "They were not dealing with nice Americans who wanted to teach the world to sing.... They were dealing with the USSR. They were dealing with the KGB. And the KGB were even more violent motherfuckers than Hezbollah."

At the time, Hezbollah had just killed kidnapped CIA Beirut Station Chief William Francis Buckley after five

months of desperate negotiations. Now, it seemed, the USSR was caught in the same nightmare. But no. Just two days after the Alpha operation, the three surviving Soviet hostages were released. No Russians have been kidnapped in the Middle East since.

For Russian policy makers, especially KGB veterans like Putin who grew up on stories of Perflyev's heroic showdown with Hezbollah, one thing remains the same—the conviction that Russians know better than Americans how to deal with terrorists. And that Moscow has a special knack for dealing with Middle Eastern politics. Beirut showed "the way the Soviets operate," wrote historian Benny Morris, *The Jerusalem Post's* diplomatic correspondent at the time. "They do things—they don't talk. And this is the language the Hezbollah understands." Or as the Russian diplomat puts it: "Say 'Beirut' in a company of [foreign service] veterans, and they will all smile and raise a toast—'Those were the days,' they say. 'We were strong. We were respected. We were feared.'"

It's easy to see how the Bondian cocktail of ultraviolence and cool professionalism, with a dash of casual nuclear brinkmanship, that Perflyev dealt out to Hezbollah in 1985 appeals to later generations of Russian Middle East hands. But in fairness, Putin's plan for Syria is more than mere posturing. The reasoning, as Putin told the United Nations in September, is clear enough. America's botched focus on regime change in the Middle East produced nothing but the "destruction of national institutions" and created a power vacuum, "which immediately began to be filled with extremists and terrorists." Russia's intervention was to prevent the kind of anarchy that followed the fall of Saddam Hussein and Muammar el-Qaddafi by "preserving a functioning Syrian state."

True, Putin's cease-fire plan requires all players from Iran to the U.S. and Saudi Arabia to adjust their expectations. And it requires the West to swallow Assad's own logic that it is preferable to keep a bloody dictator in power—for a while at least—than to tolerate the continued existence of ISIS. But as the reality of ISIS's ambitions comes home to Moscow and Paris, Putin might just have the only viable plan around. **N**



BACK IN THE USSR: A KGB veteran, Putin grew up on stories of Russian supremacy in the Mideast in the days when a Hezbollah leader was left wondering, says a diplomat, "Are these crazy Russians really *that* crazy, to drop a bomb on Qom?"

CANNABIS CRUSADER

TRAVIS MAURER IS
LEADING THE BATTLE
TO LEGALIZE POT IN
AMERICA'S HEARTLAND



BY WINSTON ROSS

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GRASS-ROOTS EFFORT: Maurer has pumped a lot of his own cash, mostly profits from dealing pot, into his campaigns for legalization.

A

About 30 minutes before our plane is scheduled to take off, Travis Maurer strolls up to the gate at Portland International Airport in shorts and flip-flops, flashing a square-jawed smile. Broad-shouldered and affable, Maurer looks like the perfect spokesman for any cause, and he deftly charms his way into a window seat. He's just eaten some ice cream, he tells me as we board, and he's in a surprisingly good mood for someone about to spend the next few hours in coach. A short while later, the plane lifts into the sky and Maurer falls asleep. The ice cream, it turns out, was laced with THC.

We are flying to Maurer's hometown, St. Louis, where he is launching a campaign to legalize marijuana in Missouri. A college dropout and convicted pot dealer, Maurer knows a lot more about selling drugs than legalizing them. But in 2014, he emerged as the driving force behind an improbable measure that legalized weed in Oregon. It's now one of four states, along with the District of Columbia, that no longer ban cannabis. From California to Maine, activists are eyeing new targets for 2016, mostly liberal or libertarian strongholds where polls suggest voters are ready to rewrite pot laws. Maurer, however, wants to replicate his quixotic effort in an unlikely battleground: Missouri, a deeply red state where many hold a dim view of "soft" drugs like marijuana. If he pulls it off, he can prove Oregon wasn't a fluke and make Missouri the model for legalizing cannabis anywhere in America, not just on the weed-friendly West Coast. The only problem: His black-market past keeps getting in the way.

As we step off the plane on a hot and sticky night in August, Maurer and I head to baggage claim.



ROLLIN' IN IT: Weed advocates are a mix of altruists and those eager to profit from legal endeavors, such as this grow house in Denver.

"Where are you staying?" I ask him.

He stares at me blankly. "Uh, I don't know."

He's not kidding. Maurer hasn't considered where he'll sleep tonight, or even how he's getting back to Oregon. When I tell him that I booked my hotel room and rental car days ago, he smiles. "Sweet. I'll just ride with you."

NOT YOUR AVERAGE STONER

Maurer books a room at my hotel in Clayton, the well-heeled seat of St. Louis County, and the next morning he meets me in the lobby wearing a T-shirt with the slogan "No more drug war" emblazoned across it. He wears the shirt everywhere to draw attention to his cause. I offer Maurer a vape pen filled with cannabis extract, which I snuck onto the flight. He quickly commandeers it, drawing a hit as we pile into my rental car.

We drive to the hipster haven of South City to pick up John Payne, a gay, Type A libertarian Republican who doesn't smoke. He's Maurer's opposite in many ways and his unlikely partner in Show-Me Cannabis, Missouri's largest marijuana advocacy group. Maurer founded the organization; Payne runs the day-to-day operations. They met four years ago at Hempstalk,

a marijuana festival in Oregon. "One of the first things he told me is, 'We're going to legalize marijuana in Oregon and Missouri,'" Payne says. "I was thinking this guy maybe is nuts. But then he's introducing me to a pollster, an attorney, [and it clicked]. This isn't just some stoner who thinks he's brilliant and has a huge ego."

The three of us head to Springfield, the most conservative city in the state, where Brad Bradshaw, a Democratic candidate for lieutenant governor, has invited stakeholders to discuss the medical marijuana bill he's pushing. Maurer, however, wants full legalization in 2016.

As we wind south through Missouri's green rolling hills, we pass signs advertising straw and luring tourists to Branson. Soon we near Springfield and drive past billboards promoting the city's biggest tourist draw: Bass Pro Shops. We are a long way from Portland, one of the nation's most liberal cities in a reliably blue state run by America's first bisexual governor. In Missouri, two-thirds of the state legislature is conservative. And while the public is divided over legalizing pot, the cops aren't. Defying the law, Maurer twirls my vape pen, taking a hit every few minutes. "I want to lobby the legislature to legalize marijuana in the next session," he says.

Payne laughs incredulously, and Maurer asks, “Is that like landing someone on Mars?”

It is, Payne explains, because polls show support at just under 50 percent. Before joining Show-Me Cannabis, he worked at a libertarian think tank, and he has far more political experience than Maurer, who doesn’t seem to care. “You might mistake [Maurer’s ambition] for a delusion of grandeur,” says Troy Dayton, CEO of the ArcView Group, the nation’s largest marijuana investment firm, based in Oakland, California. “But most people who have delusions of grandeur are about themselves. Travis’s delusions of grandeur are about what he can accomplish politically.”

We pull up to Bradshaw’s office in Springfield, and I drop off Maurer and Payne for the meeting. Two hours later, they emerge, pissed.

in a way that alcohol did not. Not long after he started smoking it regularly, Maurer began selling it too. Weed also helped him make friends.

Two years after high school, Maurer met Leah Shantz, and they fell in love. In 1997, they moved two hours from St. Louis to Columbia, where they both enrolled at the University of Missouri. Maurer didn’t last long: “I thought it was boring.” Instead, he borrowed \$1,100 from a high school friend and put it all into pot. “My buddy got me a pound,” he says. “It was easy. I sold it right away.” Eventually, Maurer says, he worked his way up the drug chain. His biggest buy was 200 pounds, a sale worth nearly \$120,000. “People thought I was a whale,” he says.

A COLLEGE DROPOUT and convicted pot dealer, Maurer knows more about selling drugs than legalizing them.

‘CAN I PUT SOME PANTS ON?’

The first time Maurer smoked pot, he was 13 years old. He liked it, but it wasn’t until two years later, when his friends started partying, that he became a habitual smoker. “I decided if I was going to intoxicate myself, marijuana was a better decision,” he says.

Maurer definitely wanted to intoxicate himself. He struggled to make close friends as a kid. His childhood was rife with abuse, and that’s all he will say about it. Pot numbed his pain

“I could have taken it to the next level at any point. It was never my ambition.” All he wanted was to pay his bills and have enough money to travel a little, mostly to Phish and Widespread Panic concerts. “I wasn’t trying to build houses and buy boats. But I made as much money as I wanted.”

Moving all that cash around made him a target. Maurer was often ripped off, he says, fronting someone an ounce and not getting paid for it. Once, in 1998, after a night at the Blue Note, a music venue in Columbia, a friend robbed him at gunpoint. “Give me your fucking money,” his friend said, “or I’m going to shoot your ass.” Maurer took out all his cash, \$2,400, and laid it on the ground.

Eventually, Maurer started growing his own pot in a closet in his townhouse. He sold to only a handful of people, he says, to avoid getting busted, and he and Leah, now his wife, lived a comfortable life on his illicit income. In 2005, she gave birth to their first child, Mason. Their second, Linden, was born a year later.

Now a mother, Leah began pushing Maurer to find a different job. He kept growing weed, but in 2003 he started a natural stone company. It folded a few years later as the recession hit. Next, Maurer started an energy efficiency company, but that fell apart too—along with everything else in Maurer’s life.

On the morning of March 9, 2009, Maurer was at home on his computer in his underwear when he glanced out the window and spotted a man in a flak



RED, BLUE AND GREEN: Maurer’s critics say Oregon was a much more hospitable state for his message than Missouri.

jacket, wielding a gun. Maurer thought he was about to be robbed. “I was thinking, I have to go get my gun somehow without being shot.” He stood up to run and spotted several more armed men. That’s when he realized they were cops. One officer pointed a rifle at Leah through a window, he says, and demanded Maurer open the door. “OK, my wife is here, and I’ve got two dogs. We’re nice. We’re peaceful,” he said. “Don’t shoot. The dogs are nice.” Maurer opened the door, and the police charged in, ordered him and Leah to the ground and began a search. “Then I heard the bookshelf pop open, a little squeak, and I heard one of the cops go, ‘Holy shit.’”

A few minutes later, an officer came out with a smirk on his face. “We got your grow.”

“Of course you did. You came in with an army,” Maurer replied. “Can I put some pants on?”

Despite the SWAT team and the guns and that “Holy shit,” Maurer got off lightly: He spent only a day in jail and pleaded guilty a year later; he was sentenced to five years of probation and paid \$375 in fines. But he hadn’t anticipated all the consequences of getting busted. “I guess I was really arrogant about it,” he says. “I figured if I ever got in trouble, I’d get a get-out-of-jail-free card. But that shit ain’t free.”

Just ask his family. Local newspapers plastered Maurer’s grinning mug shot on the front page. Parents whose kids attended the same preschool as his kids threatened to remove their children if Mason and Linden were there. Leah’s moms groups, which she started, essentially disowned her. “We were deeply rooted in this community,” Maurer says.

Not long after the arrest, he says, he gave his wife an out. “If you need to go in a different direction here, I totally understand,” he said. “I’ll support you 100 percent.” Leah didn’t hesitate; she stood by her husband. “What he did was not an immoral thing,” she says. “My love for Travis is so steadfast and so strong, I’ve never really wavered on that.”

Three months after Maurer’s arrest, his family packed their belongings and moved to Oregon. “I was in a rough spot,” he says. “I was in the most rough spot I’ve ever been in. I had no fucking clue what I was going to do.”

It didn’t take him long to come up with something.

‘WHAT A FUCKING ORNERY SCHMUCK’

After their conversation with Bradshaw, Payne and Maurer join me in Columbia for dinner at a local pub. The meeting did not go well. Everyone in the room, an assembly of lawyers and activists, agreed that medical marijuana should be legal in Missouri. What they didn’t agree on: how to pull it off. Bradshaw’s proposal would require patients to buy pot from licensed dispensaries and



REC ROOM: The pro-weed crowd is split between those who favor full legalization and those pushing for just medical marijuana, along with many restrictions on its use and sale.

ban growers from selling and distribution. The plan also called for a nearly 50 percent tax on the product, and convicted felons would be prohibited from participating in the industry for 10 years after their release from prison. The national cannabis groups that fund legalization efforts oppose these provisions, as do many activists in Missouri. They want patients to be able to grow their own pot, and they say the high taxes and a ban on doing business in multiple parts of the market would make it impossible for weed companies to turn a profit.

At the end of the meeting, Maurer told Bradshaw some activists won’t like his plan and might support a rival initiative. “He didn’t even let me finish,” Maurer says, adding that Bradshaw

Bradshaw's leverage is money, which will allow him to hire staff and begin the expensive work of signature-gathering for a petition. Maurer wants to raise enough to fund a rival campaign. That won't be easy. But as we eat, Maurer declares he's determined not to let Bradshaw bigfoot him. He just needs to raise \$1.2 million in the next year or so.

MARIJUANA 'MASTERMIND'

Only this time Maurer had wider ambitions. Using the proceeds



from his new grow operation, he founded Show-Me Cannabis. He gobbled up as much information as he could: how bills are passed, how polls work, how lobbyists reach legislators. He bought a website, TheWeedBlog.com, now one of the most widely read marijuana forums in the world.

has a different motivation, partly because of his bust. "Being arrested and put in a cage...you never forget that," DeAngelo says. "You never forget the people who are still being subjected to that kind of treatment. It becomes personal."

Maurer shifted his focus back to Missouri. In 1996, Jeff Mizanskey was sentenced to life in prison without possibility of parole for conspiring to sell 6 pounds of marijuana in the Show-Me State. The court based his sentence on a three-strikes law that the legislature later repealed. In 2013, Mizanskey's son Chris went to a meeting of Show-Me Cannabis and soon began lobbying the governor for a pardon. Maurer helped him by using one of his brilliant tactics: texting to collect data, raise cash and blast messages to supporters. In 2012, he bought the text code 420420 and began using it to lobby on Mizanskey's behalf. By texting "Jeff" to that number, users received information about how to reach their legislators and appeal for his pardon. Show-Me Cannabis also held town hall meetings around the state and paid for billboards across from the governor's mansion and by the highway exit to the Capitol. The campaign received widespread attention, and the petition garnered 390,000 signatures. In May, Governor Jay Nixon commuted Mizanskey's sentence, and he was freed in August.

Two years ago, Maurer shifted back to Oregon. At the time, the state's cannabis advocates were splintered. Some worried that legalizing recreational pot would squash medical growers and medical dispensaries (as it has in other states). Others thought voter turnout in a midterm election didn't bode well. They'd tried to amend marijuana laws twice in recent years and lost both times. The risk with a 2014 campaign was straightforward—fail, and you waste millions of dollars and set the movement back. A better idea, many felt, was waiting for 2016, a presidential election year, when greater voter turnout often means a greater chance of success for cannabis causes. Pushing for legalization also presented a huge risk to Maurer—fail, and he shatters his credibility.

FROM LEFT: ALEX MILAN TRACY/SIPA/AP; IVAL LAWHON JR./ST. JOSEPH NEWS-PRESS/AP



WEEDING: Missouri police still actively enforce state laws against pot, making busts and uprooting marijuana plants.

pollster Maurer hired for the campaign. “But he has the humility about himself to put smart, talented people in the room and let them do the work.”

In April 2013, Maurer cold-called two major legalization advocates—Ethan Nadelmann, executive director of the Drug Policy Alliance, and Graham Boyd, former director of the American Civil Liberties Union’s Drug Policy Litigation Project—and convinced them to attend a meeting with

that if you treat it as a regulate-and-tax thing, more like alcohol, you could pick up another 10 percent in the polls, at least.” Maurer paid for half of the poll with his own money. “It’s a personal mission,” DeAngelo says. “He believes in what he’s doing, he has a tremendous amount of energy, and he’s completely fearless.”

He also convinced veteran political strategist Liz Kaufman to run the campaign—an idea she initially rejected. “He’s one of the most positively persuasive people ever,” she says. “He’s a good

“GIVE ME YOUR FUCKING MONEY,” his friend said, “or I’m going to shoot your ass.”

stakeholders at the law firm he’d hired. He told the group about the Columbia raid and his plan to legalize marijuana in Oregon. “It was the most impressive presentation I’ve seen by a state-based group,” Nadelmann tells me. “But my response was, ‘Travis, it’s really dependent on the polling.’”

So Maurer did some research. He and Horvick discovered that they got better results by wording a ballot initiative in “professional” language, says Brian Gard, who runs the advertising and public relations firm Maurer hired for the campaign. “He found

motivator, and I don’t mean that in a bullshit way.”

Being a family man helps. Leah has been volunteering at events, giving speeches and working side-by-side with Maurer on fundraising and other efforts, and she helped found two pro-cannabis groups on her own. “She’s a central-casting mom,” says Kaufman. “Her kids play the trumpet, and they’re not weird.”

Worried that his felony rap might damage

the effort, Maurer stayed in the background and focused on fundraising. He took a consulting job at Privateer Holdings, a Seattle-based investment firm that owns the dispensary-ranking website Leafly, among other enterprises. After four months, though, Maurer had to leave the company. The gig required frequent trips to Canada, and his felony rap made that difficult.

Against the odds, Oregon passed the legalization measure by the widest margin of any marijuana initiative in a nonpresidential election year. Maurer's gamble paid off, and with his probation

Over the next six months, Maurer burned through about \$850,000 of Quast's money. He put \$400,000 into building a dispensary in northeast Portland and another \$450,000 into paying down his debts and funding his political goals. Quast tells me he questioned some of Maurer's spending but ultimately understood it was necessary to pay for things unrelated to the dispensary. But he also wanted to know his investment would see some

“HE WAS BORROWING FROM PETER to pay Paul. I don’t think he had any idea how to run a business.”

ending, he could finally tell his story. In July, *The Oregonian* newspaper dubbed Maurer the “mastermind” of legal weed, and his picture was once again in the newspaper, only this time it wasn't a mug shot. Maurer had become a marijuana folk hero. He had picked apart prohibition in Oregon and set his sights on the next battleground: Missouri. “Just because he got it done right once doesn't mean it's going to work the next time,” says Dayton, the ArcView CEO. “But...Travis is great for states on the edge of a big longshot. I hope he does it again in Missouri and in other places.”

Behind the scenes, however, Maurer had a major problem.

HALF-BAKED

After winning in Oregon, Maurer was nearly broke. In February, he received an eviction notice at the warehouse where he was growing weed; the landlord found a tenant willing to pay twice as much rent, he says. That meant Maurer could no longer supply patients with the weed he was growing. With his business in trouble and all his money invested in politics, Maurer began looking for a partner to bankroll him, pay his bills and fund his activism.

Enter Randy Quast, a successful trucking company owner who was convicted of felony possession of marijuana after a burglar broke into his house in 2007 and the responding cops found a few ounces of weed in a safe. Like Maurer, Quast's arrest inspired him to change the law. And after watching Colorado, Washington and Oregon legalize pot, he thought he could make some money too. In February this year, Quast moved to Oregon and met Maurer at a pro-pot confab. Weeks later, Maurer asked him for a \$20,000 loan.

Quast gave him the money, and Maurer used that loan to pay some bills. Eventually, the Missouri native convinced his new friend to buy into his entire enterprise: the dispensary, the blog, the text code and whatever else might turn a profit. Maurer wanted \$1.5 million, Quast says, for an undefined stake in the business. He forked over the first few checks, and the two set up a company. Like many marijuana deals, this one was based on trust, on handshakes. There was no agreement on how the business would work or how the proceeds would be spent.

kind of return. “We're giving out donations, and we're not even up and running,” Quast says. “He was borrowing from Peter to pay Paul. I don't think he had any idea how to run a business.”

Maurer says Quast had no qualms with how he spent the money. Because he was evicted from the warehouse, though, he still can't turn a profit. Like others in the industry, he's struggled to transition from the illegal drug market, where profit margins are astronomical, to a legitimate business that's far less lucrative or predictable. “That's what I've been doing my whole life—cash and carry, handshakes,” Maurer says. “Now I'm to a point where in order to participate in the legal world you have to really formalize things and make them legitimate. You have to sign contracts, have attorneys and official agreements.”

Except there are no contracts, no agreements. And the fallout that ensued has become all too common in states looking to legalize weed. Maurer



TEXT WIN: Mizanskey's life sentence for possession was commuted after an intense lobbying effort Maurer helped fund and coordinate.

is part of a wave of weed dealers turned activists who emerged in the late 2000s, fighting the drug war on principle. But over the past few years, as pot has become legal in four states and the District of Columbia, another group of advocates has arrived: experienced entrepreneurs looking for “green gold.” The two groups have sometimes clashed, just like Maurer and Quast.

Maurer says he has a new Las Vegas-based investor who’s convinced his partner to keep working with the company in exchange for a return on the dispensary and other proceeds. (Quast did not respond to a request for comment about the purported partner.) Maurer says the new investor has pledged \$350,000 to get the business running again. Until that check clears, though, Maurer is in limbo and is struggling to pay his rent.

‘I’D LIKE EVERYBODY TO WRITE A CHECK TODAY’

Maurer’s last—and one of his most crucial—meeting in Missouri is in a back room at a swank Columbia restaurant called Bleu. Dozens of people—venture capitalists, entrepreneurs, farmers and even a registered nurse—are chatting under the dim lights. All want to get into the pot business if Missouri changes the law. Maurer and Payne are here to ask them for the seeds of the \$1.2 million they need to get a measure on the ballot.

Joining them is Eapen Thampy, a former ally of Maurer’s and now his rival. In 2009, Maurer met Thampy at a bar in Columbia. The two drank wine and talked about cannabis. Then they began working together to push for legalization. Not long after they started collaborating, though, Maurer and Thampy began to clash—over money, credit and control.

The meeting begins, and soon the two are at it in front of everyone. Maurer introduces himself as an activist and the owner of The Weed Blog. He’s finalizing a grow, he says, and doing some consulting about the industry. He offers to use his text code to send out alerts for the group. But Thampy pipes up. “I’ve been offered the same text code before,” he says. “And I’d be very uncomfortable getting into that agreement without knowing who owns the data and how it’s managed.”

Maurer tries to shut him down. “[The association] owns all the data and would be able to manage it exclusively,” he replies testily.

Next, Payne gives his pitch for money. Someone asks about Bradshaw’s bill and Payne parries: “We’re still in the process of negotiating an agreement. I’m confident we can get on the ballot regardless of whether we have his support or not.”

Maurer jumps in, warning that Missourians who want legal cannabis will need to put their wallets behind the effort. “There’s literally no other way we can move forward, without money,” he says. “I’d like everybody to write a check today.”

The next hour is chaotic. Everyone is arguing and speaking out of turn. Everyone wants money, but no one is actually donating any. And Thampy is constantly taking shots at

Maurer, who snipes right back at him.

Lee Winters, a local farmer in a plaid shirt, interrupts Maurer with another problem. “The industry backers I’m speaking with want to know what this industry is going to be constructed upon. What does it look like? What regulations are there, and how can they move into it? Until the [legalization] petition is formalized and public, nobody is putting money forward.”

“I totally understand that,” Maurer says. “But, unfortunately, to get to that point requires some money.”

The questions, sniping and fruitless fundraising appeals continue until Maurer and Payne—both clearly frustrated—slip out so they can head home.

A month later, Show-Me Cannabis files its medical marijuana initiative in Missouri, which rivals Bradshaw’s effort for cash, volunteers and votes. Maurer, however, still vows to keep pushing for full legalization. That is, as soon as he can find the money to buy the polling that he says will confirm that he can win in Missouri—if not this year, then



+
THIS BUD’S FOR MIZZOU? Voters in Missouri may have to choose between full legalization or just to allow medical use in 2016.

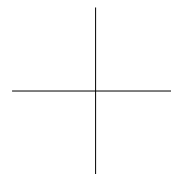
in 2018. And while other cannabis crusaders have their eyes on easier targets, such as California and Maine, Maurer’s thinking about another state in the heartland: Ohio, where a legal pot bill recently failed. “There’s a big fracture there between the money guys and the grassroots,” he says. “Maybe I can build a coalition.”

Maybe. Because there’s nothing Travis Maurer likes more than proving people wrong—not even THC-laced ice cream. **■**





NEW WORLD



3-D PRINTING

FOOD

WILDLIFE

CLIMATE

FRACKING

SPACE

GOOD SCIENCE

SWEETNESS AND SLEIGHT

Stevia might finally deliver on its promise to be the first sugar replacement that works

+ CANDYLEAF: In South America, the stevia plant has been used for centuries not only as a sweetener but also in traditional medicine as a treatment for burns, colic and stomach problems, as well as a contraceptive.

BY NOW, it's well-known that sugar is a health villain. But it's not easy to pull a sweet tooth, which is why food and beverage manufacturers have been looking for a delicious but noncaloric sugar replacement. Stevia is one of the latest and greatest of these efforts. It comes from a leafy green plant called *Stevia rebaudiana*, found in Paraguay and Brazil, where it has been used for centuries as a sweetening agent. The plant's leaves contain compounds called steviol glycosides that make it 200 to 400 times sweeter than table sugar (sucrose). Unlike sucrose, though, stevia comes without calories or carbs.

But "candyleaf," as locals call it, has one major drawback: a bitter aftertaste, which is OK in small doses but in high amounts can wipe out the sweetness. When Coca-Cola tried to develop a stevia-based soda, it ended up with "Life," a concoction that uses a bit of stevia but also contains enough cane sugar to maintain the sweetness consumers expect from their cola—which is why

Coca-Cola Life has only about 50 fewer calories a serving than Coke Classic.

Recently, though, food engineer Samriddh Mudgal and a group of scientists at Cornell University came up with a possible way to rid stevia of this handicap. The team first isolated the part of stevia that stimulates the bitter receptors on the surface of the human tongue.

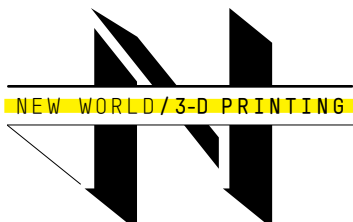
Once they figured that out, they came up with a way to keep the compound from generating that bitter taste. They added a natural protein to the stevia that prevents the bitter receptors from physically attaching to steviol glycosides' bitter compounds and successfully tested the newly engineered stevia in orange juice. The findings were published in October in *Food Chemistry*.

Because stevia is already considered "generally recognized as safe" by the Food and Drug Administration, it'll be relatively quick to market. Mudgal says it could be in your two-liters in as soon as two years. **N**

BY

SAMANTHA OLSON

[@SnoWrite124](#)



JUST HIT PAWS

Vets can now order up carbon fiber and 3-D printed prosthetic limbs for injured cats and dogs

WHEN ANIMAL rescue took Noah from his former owner's house and brought the German shepherd to Houston's VERGI emergency hospital in late September, Dr. Sarah Dewhirst was "horrified by the neglect and abuse" she saw. The fur and pads were gone from Noah's right front paw; all that was left was exposed bones and infected tissue. "My initial reaction was just to amputate at the shoulder," says the veterinarian, citing standard practice for severely injured dogs.

Then a colleague told Dewhirst about Bill Bickley, founder of the Houston-based Pet Artificial Limbs and Supports (PALS). Bickley, 46, is a new breed of specialist, creating animal orthotics and prosthetics. For over a decade, he worked on human limbs. Then, three years ago, Bickley read about the small but growing field of animal orthotics and prosthetics, pioneered in the first years of this century largely by Martin and Amy Kaufmann, founders of Colorado-based OrthoPets; Jeff Collins of K-9 Orthotics and Prosthetics in Nova Scotia; and Derrick Campana of Animal Ortho Care in Virginia.

The industry giant is OrthoPets, which started spontaneously in 2002 when Martin's cousin's schnauzer had a stroke and needed an orthotic. Soon, the Kaufmanns turned a 400-square-foot garage into an orthotics and prosthetics facility, and in 2007 they made OrthoPets their full-time focus. Now they have 21 employees and 200 patients a month via distribution centers all over

the world. Using videos, pictures and details from veterinarians, they work with clients throughout South America, Europe and Asia.

Still, Bickley saw room for innovation. Most limbs he saw "were heavy-duty without a lot of finesse—they had no bounce or natural motion." So Bickley started pondering and tinkering, finally hitting on the idea of using carbon fiber, which is both strong and flexible; it's the material of the blades for runners who are amputees. But Bickley needed some carbon fiber to actually test the idea. The first five places he called "either laughed at me or said they'd only do it for a big production run and a lot of money." He left a voice mail for Hans DeBot, whose company, deBotech, has used carbon fiber to help build everything from Olympic bobsleds to military aircraft and Lamborghini. Bickley was simply hoping DeBot might recommend a smaller operator willing to help.

"But I have three dogs and love animals, so I said, 'I'll help you, and we'll worry about the cost later,'" DeBot says. The two collaborated on the project, testing prototypes until they hit an idea: different "spring rates" based on the size of the dog for the carbon fiber blades that act as the dog's legs. Eventually, they also fine-tuned a back leg with progressive stiffness, DeBot says, going from less flexible up top to more pliant near the bottom. Bickley then created a "foot" by injecting silicone gel into a cup pad at the bottom of the leg to provide the dog with a softer landing.

BY
STUART MILLER



A LEG UP: Cervantes and Paquito outside their home in Erie, Colorado. Cervantes chewed his foot off after it was accidentally caught in a hunting trap in Spain. OrthoPets fitted him with a prosthetic replacement.

The other leaders in the field have their own approaches and innovations. At OrthoPets, for example, the company takes a fiberglass impression of a limb, scans it and makes a 3-D model. A machine carves the final shape from a block of foam. Then the prosthesis gets vacuum-sealed with plastic.

While Bickley still earns much of his living working with humans, in two years he has built up recognition locally. He helps mostly dogs, but he has also provided a knee brace for a flamingo at the local zoo and a prosthetic leg for a ram. One prosthetic dog leg typically costs around \$1,500, plus \$100 in annual maintenance because the dogs chew the straps that connect the artificial limbs to their legs.

“He has made a huge difference in the services we provide,” says Dr. Brian Beale, a surgeon at Gulf Coast Veterinary Specialists in Houston. “The carbon fiber provides more flexibility and probably feels more natural to the dog, so they can really run on these things.” Beale also praises Bickley’s orthotics—custom braces, for example—and explains that while the prosthetic is the more dramatic fix, the orthotics can often help a pet avoid surgery. (All the companies say orthotics is 80 to 90 percent of their business.)

The field is so new that there’s no formal education or licensing program, nor have any real studies been conducted about the impact of orthotics and prosthetics. For many vets, Beale says, “the mindset is still just to cut the leg off and assume the other three are good enough,” though he thinks that will change if vets and owners see the difference a prosthetic makes. Dewhirst says living on three legs can “lead to

arthritis and potentially decrease a dog’s life span.” But when she was in school in 2009, she heard of only occasional cases of prosthetic work, which is why her instinct had been to amputate Noah’s leg at the shoulder.

Fortunately for Noah, Dewhirst heard about the new prosthetics. After she reached out to Bickley, a local animal rescue group started a social media campaign to raise awareness and money for his new leg. Then Dewhirst performed the operation that would allow Bickley to attach the prosthetic leg. The operation was a success, and now Noah’s walking around on all fours again.

Bickley, Campana and Martin Kaufmann try to spread the word to vets at surgical conferences and to owners at dog clubs and pet expos. “There’s a lot more awareness than there was five years ago,” says Amy Kaufmann. In some veterinary schools, animal prosthetics have already become part of the curriculum. Dr. Jamie Peyton, service chief at the UC Davis Veterinary Medical Teaching Hospital’s Integrative Medicine Service, says her students attend lectures on the subject and a weekly clinic in which she works with orthotists and prosthetists on not only dogs and cats but also livestock.

In addition, Peyton serves on a committee at the American Association of Rehabilitation Veterinarians, whose goal is to spread the word on animal orthotics and prosthetics to other

BICKLEY HELPS MOSTLY DOGS, BUT HE’S ALSO PROVIDED A KNEE BRACE FOR A FLAMINGO AT THE LOCAL ZOO AND A PROSTHETIC LEG FOR A RAM.

universities. And the Kaufmanns have written a textbook on the subject due in 2016 that they think will further fuel awareness. “It will change standard protocol taught in veterinary schools,” Amy Kaufmann says.

“The textbook will be valuable,” says Peyton, “but what is really going to change people’s minds is when they see the difference. And the best exposure is clinical exposure—when they see a dog with three legs, and then they see a dog running more naturally with a prosthetic.” **N**



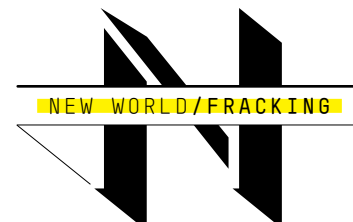
FROM NORTH DAKOTA TO PARIS WITH LOVE

Lessons for the COP21 climate talks from the heart of the fracking boom in the United States

KANDI MOSSETT plans to accompany an extraordinarily influential lobbyist to the United Nations 21st Conference of the Parties (COP21): her 2-year-old daughter, Aiyana. Mossett, a member of the Native American Mandan, Hidatsa and Arikara (MHA) Nation, has spent most of her life on the Fort Berthold Indian Reservation in North Dakota, which, since 2006, has been the center of

what would become the second-largest domestic oil boom in U.S. history. It came with little warning or government regulation, but a lot of jobs and money followed. So did a host of climatic, environmental, public health, social, political and even economic costs. “It’s been like death by a thousand cuts,” says Mossett, the native energy and climate campaign organizer for the

BY
ANTONIA JUHASZ
[@AntoniaJuhasz](#)



BAD BLAZE: Natural gas burns off an oil well on the Fort Berthold Indian Reservation near New Town, North Dakota. “Flaring” puts greenhouse gases into the air and releases toxins that can poison the ground.

Indigenous Environmental Network (IEN), and one of an estimated 20,000 nongovernmental organization delegates to the U.N. conference.

Mossett hopes Aiyana’s presence will force President Barack Obama and every other head of state and government negotiator present to see with their own eyes “the people who they are making decisions for...those of us who live on the front lines of fossil fuel extraction. Those of us who will bear the full consequences of their decisions.”

Obama is pushing for an ambitious accord at the COP21 in Paris, and to do that he will need the help of activists like Mossett and the tens of thousands of others in Paris she is joining in protests, panels and more, not only to convince their governments to sign an accord but also ensure that commitments made in Paris are implemented, enforced and expanded upon at home. Mossett, a veteran of two COPs, shares the certainty of many in Paris that a historic agreement will be reached, one that commits governments to the first-ever legally binding international climate accord. But she is concerned it will not go nearly far enough.

The heart of the North Dakota oil boom is lit with wild flames, night and day. They appear everywhere and all at once—bright yellow and occasionally black bursts of fire roll low along the earth, blown by wind, or shoot 20 feet or more into the sky. The release of natural gas is accompanied by a sound like a rush of air and on occasion an overwhelming stench of sulfur.

“These were never here before,” Mossett says, pointing with her chin to the flares as she drives south out of New Town, leaving her mother’s home behind her and heading deeper into the farms and cattle ranches that, along with the omnipresent oil operations, dominate the 980,000-acre reservation. Her uncle lives on and works a 360-acre parcel of land here originally owned by her grandfather. After pulling into his dirt driveway, Mossett shares a video on her phone of a fire that erupted across the road a week ago. Heavy black smoke and flames pour out of the wellhead for over six hours before finally being brought under control.

Mossett grew up in homes all over the reservation. She moved to Montana two years ago when Aiyana’s father got a job there, but work and family frequently bring her back. She often considers moving back, but she says, “I worry about Aiyana’s health when we’re here, what’s in the air she’s breathing, the water she drinks.” Her voice trails off. Her toddler, watching a movie in the backseat of the car, coughs painfully, as if on cue.

The vast majority of North Dakota oil production comes from hydraulic fracturing, or fracking, including from the Bakken Formation

underneath the reservation. It’s common for oil and natural gas to reside together, but in North Dakota drillers are primarily interested in the more abundant oil. When they’re not required to build the infrastructure to capture and sell the natural gas—such as pipes—the cheapest option is to burn it off at the wellhead.

Because of a lack of regulation, nearly 40 times more natural gas was flared or vented (released directly into the air without burning) in North Dakota in 2014 than in 2005, with 102,855 million cubic feet released in 2014, almost half the total for the entire country. The surge brought the U.S. the dubious distinction of joining the list of the world’s top five worst flarers, which are, in descending order: Russia, Nigeria, Iran, Iraq

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“A LOT OF IT WON’T EVEN BE FELT OR SEEN FOR 20, 30, 40 YEARS, AND THAT’S WHAT KEEPS ME UP AT NIGHT.”
—

and, since 2012, the U.S. The scenic buttes of the reservation’s famed North Dakota Badlands, where wild mustangs still roam, are now alight with the flames of flares so numerous and bright that they’re visible from space.

Flaring emits carbon dioxide and methane, which is a potent greenhouse gas with a global warming potential more than 25 times greater than that of carbon dioxide. Flaring also produces a slew of other pollutants linked to serious public health effects, including asthma, cancer and early death from respiratory and cardiovascular causes. The pollutants can harm animals, crops and vegetation; land in flaring areas in Nigeria, for example, has lost fertility because of soil acidification.

The darker a flare burns, the more pollutants it releases. Most flares burn yellow, but substandard or poorly maintained equipment, accidents or drilling errors can cause a flare

to burn black, releasing black carbon, a major component of soot.

Flaring is one of the most visible problems associated with the fracking boom, but it's far from the only concern. Accidents, fires, blowouts, leaks, spills, ruptures and other problems occur regularly in North Dakota, with nearly 1,800 such incidents reported in the past 12 months, according to the North Dakota Industrial Commission. And that might be a lowball estimate; the Associated Press uncovered 750 "oil field incidents," including pipeline leaks and other oil spills, from January 2012 to October 2013 that were not reported to the public. Meanwhile, the number of oil and wastewater spills per well in North Dakota almost tripled between 2004 and 2013.

Oil spills are bad, but wastewater is what most worries Edmund Baker, the director of the MHA Nation's Environmental Division—"at least oil's organic, and it's easier to clean up." In addition, because oil makes companies money, they're apt to try not to waste it. Wastewater, an unwanted by-product of the oil drilling process, contains fracking chemicals, oil, radioactive material and water that's been dredged up from deep underground—and which, in North Dakota, is 17 times saltier than ocean water. It can destroy farmland, sterilizing the soil for decades.

In July 2014, 1 million gallons of wastewater spilled on the reservation from an underground pipe owned by Crestwood Midstream. The Environmental Protection Agency found that the wastewater reached Lake Sakakawea, the primary drinking water source for the MHA Nation and its "cultural and spiritual center," Baker says. Though the MHA is a sovereign nation endowed with the authority to regulate much of the oil operations on its territory, it lacks the capacity and, in most cases, the will to do so. Baker is frustrated. The water, he says, "is a waste product, and I am the janitor," coming in after a spill and mopping up the mess.

The environmental damage done by fracking is pervasive. But, says Mossett, "people don't often believe it until they see it with their own eyes. And a lot of it won't even be felt or seen for 20, 30, 40 years, and that's what keeps me up at night." Which is why Mossett and IEN will join Greenpeace, 350.org, the Sierra Club and at least 130 other domestic and international organizations in delivering a "Keep Fossil Fuels in the Ground" declaration at a press event on December 6 in Paris. Co-author Esperanza Martinez of Ecuador's Acción Ecológica, presented the original proposal to achieve this goal eight years ago at COP13 in Bali. In 2014, the U.N. Intergovernmental Panel on Climate Change reached the same conclusion,



+ WON'T BACK DOWN: Mossett is arrested in front of the White House during a 2011 protest against the Keystone oil pipeline in the U.S. and the Tar Sands Development in Alberta.

and top U.N. climate official Christiana Figueres warned that to meet the internationally recognized threshold for avoiding the most dangerous effects of climate change—limiting the world to 2 degrees Celsius (3.6 degrees Fahrenheit) of warming over pre-industrial levels—"three-quarters of the fossil fuel reserves need to stay in the ground."

The declaration makes several demands of governments: the end of subsidies to the fossil fuel industry, that the wealthier countries of the world promise to fund a "just transition to a clean and renewable energy economy for all" and, most importantly, that fossil fuels be kept in the ground by ending exploration and new extraction. The goal, explains Andrew Miller of the San Francisco-based Amazon Watch, is to change the discourse at the COP—most of the climate-related commitments countries have made to date have

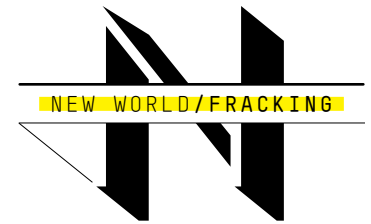
focused largely on the consumption side of the fossil fuel problem, continuing to ignore the critical production and supply sides.

"Keep it in the ground!" is the rallying cry unifying many Paris events. They were also the words used on November 6 by President Obama in his public statement explaining his decision to reject the Keystone XL oil pipeline. "Ultimately, if we're going to prevent large parts of this Earth from becoming not only inhospitable but uninhabitable in our lifetimes, we're going to have to keep some fossil fuels in the ground." However, with a few exceptions (such as a ban imposed on oil and gas drilling in Alaska's Bristol Bay), this hasn't been reflected in his administration's policy to date. Under his guidance, the U.S. has followed an "all-of-the-above" energy strategy—in June, the U.S. emerged as the world's largest producer of oil and natural gas (combined), while U.S. exports of both products are at all-time highs.

One of Obama's major initiatives to lower the U.S.'s impact on global warming is the Clean Power Plan, a set of new regulations to limit emissions from power plants. Though the plan will result in the U.S. consuming less coal, there is nothing in it to stop the same amount of coal from being produced in the States and then shipped to, say, China. Only specific restrictions on production would ensure that fossil fuels are not burned at all.

The failure to date of so many nations, including the U.S., to implement or even propose policies that keep fossil fuels in the ground is one reason the 138 individual climate commitments submitted by nations thus far do not meet the 2 degrees Celsius target. According to an analysis by Climate Action Tracker, the commitments currently project to limit us to approximately 2.7 degrees Celsius of warming—not nearly enough.

Government restriction on fossil fuel production isn't that crazy of an idea. In fact, it's already being done in fits and starts. In 1982, for example, the federal government imposed moratoriums banning any new offshore oil drilling off the U.S. Pacific and Atlantic Coasts—though, under heavy industry lobbying, they were lifted in 2008. And in the last several years, because of intense public pressure, local bans and moratoriums on oil and natural gas drilling, particularly using fracking, have proliferated across the U.S., including a fracking ban on the entire state of New York. The reason drilling rigs aren't in Yellowstone National Park or the Grand Canyon isn't the lack of interest among energy companies—it's because such



activities are banned there, as in most National Parks. And right now, up for debate in Congress is the "Keep It in the Ground Act of 2015," introduced on November 4 by Senators Bernie Sanders (I-Vt.), Jeff Merkley (D-Ore.), Ben Cardin (D-Md.), Barbara Boxer (D-Calif.), Kirsten Gillibrand (D-N.Y.), Patrick Leahy (D-Vt.) and Elizabeth Warren (D-Mass.), that, if passed, would end new federal fossil fuel leasing on all public lands and oceans, and cancel all existing offshore federal oil and gas leases in the Arctic, removing up to 450 billion tons of potential greenhouse gas pollution from publicly owned coal, oil and gas.

The easiest time to stop a fossil fuel project is before it has begun. Mossett has worked hard on that front; she was a leader in the seven-year-

"I WORRY ABOUT AIYANA'S HEALTH WHEN WE'RE HERE, WHAT'S IN THE AIR SHE'S BREATHING, THE WATER SHE DRINKS."

long effort to stop the Keystone XL pipeline. But in many cases—including Mossett's family home on the Fort Berthold Indian Reservation—it's too late. She now has to focus on the more difficult challenge of halting operations already underway and picking up the broken pieces left behind as the shine of the oil boom wears off.

"There's a fallout you've got to deal with," says Baker, who describes living in the North Dakota oil fields as like being at the end of a party, where people are looking around at the broken glass bottles, empty cups and people passed out on the floor. That's when you start to question if it's really been worth it. Increasingly on Fort Berthold, the answer is no. **N**

ANTONIA JUHASZ is the author of several books, including most recently *Black Tide: The Devastating Impact of the Gulf Oil Spill*.



ZACK THE RIPPER

Alaskan fishers are teaming up with scientists to protect their catch from crafty, thieving sperm whales

FOR LONGLINE sable fishers in the Gulf of Alaska, there are few omens of doom more chilling than the enormous shadow of a whale approaching their boat. That's because in the past several years, male sperm whales, the lone wolves of the ocean, have been behaving strangely. They have been teaming up to hunt fish right off fishers' hooks, and every year more whales are coming to eat from the fishing line buffet, leading some scientists to speculate that they're somehow communicating about the richness of the hunting ground and sharing tips. They're destroying thousands of dollars' worth of fishing gear, altering the population of sablefish and endangering their own lives with the chance of getting caught in lines.

It all started about 20 years ago, when the sable fishing season was extended from one or two weeks to eight months. Previously, the season was so short that sperm whales swimming in and out of the Gulf of Alaska hunting for food didn't have enough time to learn the habits of the fishers. Back then, depredation, the scientific term for when animals go around plundering food, wasn't a problem. But just five years after the season extension, the whales had become so adept at hunting off the longlines that fishers were starting to panic.

Since then, it's only gotten worse, says Linda Behnken, a 30-year commercial fishing veteran and executive director of the Alaska Longline

Fishermen's Association. Today, Behnken and the North Pacific Fishery Management Council estimate that the costs of the damage to vessels targeted by whales, and the extra time and bait that go into attempting to meet fishers' quota after losing their catch, add up to more than \$1,000 per ship, per day. "Most fishermen that have experienced whale depredation will tell you that [estimate] is low," she says.

Sablefish—or black cod, as the local fishers call them—typically live 2,400 to 3,600 feet below the surface. To catch them, fishers spend six to 12 hours traveling 15 to 90 miles offshore. Once they arrive, they lay their lines. The longline generally runs about 3 miles, with an anchor on one end to attach it to the seafloor and a buoy on the other so the fishers can find it at the end of the day. Along the line, there will be somewhere between 1,000 and 4,000 hooks, with bait on each one. Boats typically set two lines at a time, which sit for 12 hours. Fishers haul in the lines using hydraulics, and one crew member will typically stand on the boat's rail and pull each fish off the hook as it comes out of the water. When no whales are present, a line with 2,000 hooks on it will typically catch 500 to 1,000 fish.

But when the whales are around, says Behnken, the fishing is miserable. "The catch can be easily one-quarter of what you would expect, and if you have enough whales on you, they can clean you out," says Behnken. "They are

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SEA BANDITS: In the Gulf of Alaska, sperm whales seem to have figured out how to communicate tips to one another about where best to steal sablefish off the longlines of fishermen.

usually taking turns going down and getting fish. When you finish hauling, they'll all come up to the surface. Last year, one came right next to the boat and rolled. He was looking right at us. Maybe he was looking to see if there was more coming." On one trip, her boat had as many as six whales surrounding it, waiting for dinner. "You start having lines come up with fish that are bitten in half, and you can see the whale teeth marks."

After years of this, Alaska's fishers reached out to a team of scientists for help. Quickly, a group formed: the Southeast Alaska Sperm Whale Avoidance Project, or SEASWAP, a collaboration among fishers, academic researchers, field scientists and both local and national government agencies. But deterring the sperm whales has proved to be much harder than anyone could have anticipated.

In part, it's because sperm whales are not well understood, despite being one of the most famous of the ocean's mammalian hunters. Scientists do know they're the largest of the toothed whales and are easy to identify thanks to their

"IF YOU HAVE ENOUGH WHALES ON YOU, THEY CAN CLEAN YOU OUT."

giant, square-shaped heads and long, pointed lower jaws. Their blowholes are set at an angle off to the left side of their heads, and they use a series of clicks and echolocation to communicate and identify prey. For the most part, they eat squid (about a ton per day), and some speculate they may even find themselves in regular battles with giant squid, as it's not uncommon for them to be found with large, suction-cup-shaped scars.

But beyond that, we don't know much. Sperm whales are very difficult to study because they dive deeper than any other great whale—more than 5,000 feet—and once they get down there they can stay submerged for up to 50 minutes before they surface for air, miles away from their



initial dive spot. So there were really no clues as to how the whales were finding the boats just as the fisherman were reeling in their lines. “Generally, what happens is the guys go out, they set their gear, let it soak for several hours and then pick it up. The whales won’t be around until they’re hauling the gear back. How do they recognize this thing that’s become the dinner bell?” asks Russ Andrews, a marine biologist with SEASWAP.

To answer the question, Aaron Thode, a marine mammal acoustic specialist at the Scripps Institution of Oceanography at the University of California, San Diego, set up passive listening devices on moorings to see if the whales or the boats were making unique noises when the lines were reeled in. What they discovered was that the sound of the bubbles created by the revving of the propellers as the boat sped up and slowed down during the line-reeling process was calling the whales.

“It wasn’t a piece of equipment; it was the way they handled the vessel,” says Thode. “We finally convinced ourselves by going out on a vessel without gear. We put the engine into gear, and in less than 10 minutes we had 40-foot whales around the vessel.” From their acoustic research, the team learned that the whales can hear this dinner bell from 3 miles away in stormy weather and up to 17 miles away on a clear day.

The next step was to understand how many whales were down there and how exactly they were eating, so the team attached underwater cameras to the fishing lines. “The most experienced whales learned they could bite the line and cause it to shake—like shaking apples off trees,” Thode says. “The fish have soft mouths, so [the whales] could shake the fish off the line, and they don’t have to risk getting their jaw caught on a hook.”

The takeaway was that there was little—maybe nothing—that could deter the whales. They’re too smart. Even attempts at playing a recording of the dinner bell sound from a decoy boat failed—the whales figured out that trick and went elsewhere for their meal. The team realized that deterrence was going to have to be replaced with a system of avoidance—figuring out where the whales were and alerting fishers so they could

steer clear. So now begins the long and difficult process of attempting to attach satellite tags to the hunters so the fishers can know where they are and remain outside that 17-mile range of the whale’s hearing ability. Andrews has managed to tag about seven whales so far by standing on a small inflatable boat and shooting the tags at each whale with an air gun. “You’ve got to wonder about our sanity sometimes,” he says.

The fishers are also starting to get pretty good at visual identification. Sperm whales are easily differentiated by the markings on their tails, and SEASWAP’s co-leader, marine biologist Jan Straley, has been able to photo-ID about 150 of the whales that spend their time in the gulf. Of those, about 12 to 15 are the worst perpetrators—including one whale the fishers have dubbed Zack the Ripper. “He’s our bad boy,” says Behnken.

But having the data isn’t enough. To successfully avoid the whales, the fishers need to work together to get at least 17 miles away from the hunters. Though fishers are not in the habit of helping one another, Behnken says, she’s been able to convince them that every time a whale

“YOU’VE GOT TO WONDER ABOUT OUR SANITY SOMETIMES.”

gets dinner, it’s receiving positive reinforcement. So using a combination of the satellite tagging maps and reports from fishers, Behnken and SEASWAP have been able to establish a makeshift whale reporting network. Early testing suggests it might work; next up is rolling it out to the whole fleet.

Meanwhile, the team has begun collaborating with other fisheries around the world where depredation is happening on a smaller scale (a group at the Crozet Islands, a French territory in the Southern Indian Ocean, is having trouble with killer whales, for example). And other organizations are starting to pick up on the acoustic techniques that SEASWAP has pioneered. But most of all, the scientists say, they will be benefiting from the unique relationship the research has developed between the fishers and the scientists.

“There are researchers all over the world that are envious of our relationship with our fishermen,” says Straley. “They trust that what we’re doing is going to be better for them and the whales in the end.” **N**



LEADING THE DIGITAL REVOLUTION: INVESTING IN NORTH RHINE-WESTPHALIA

EVEN IN GERMANY, world-renowned for manufacturing and industry, the region of North Rhine-Westphalia (NRW) stands apart. Home to approximately 17.6 million inhabitants and the cities of Cologne, Düsseldorf, Dortmund, Essen and Duisburg, the NRW region generates €625 billion euros annually, contributing 21.5% of Germany's gross domestic product (GDP). In international EU rankings, NRW as a federal state places higher than Switzerland.

Key to NRW's success is attracting foreign investment; the region received €196.6 billion in 2013, 29.9% of all foreign investment across Germany's 16 states. Here are four factors that have made NRW Germany's number one investment location:

AN ECOSYSTEM OF INDUSTRY: MULTINATIONALS TO SMES

A broad spectrum of businesses are represented in NRW, from international corporations to smaller companies that are leaders in their respective fields. 16 of the nation's top 50 companies are located in the region, including E.ON, Thyssen Krupp and Bayer, and the industrial sales of NRW-based enterprises in 2014 reached €340 billion. The cluster of large companies has allowed related service providers to play a vital role in supporting local industry,

and today 25.9% of all people employed in industry-related services in Germany work in NRW. 755,000 small and medium sized enterprises (SME's) form the economic backbone of the NRW, accounting for 99.5% of all companies in the region.

'THE SMART FACTORY': DEVELOPING INDUSTRY 4.0

NRW is playing a leading role in the fourth industrial revolution, using intelligent technical systems to create smart factories. This involves technology that can communicate wirelessly whilst carrying out physical processes, adapting the manufacturing process to be more autonomous and efficient. In the north of NRW, OstwestfalenLippe (OWL) is pioneering Industry 4.0. An alliance of 174 businesses, universities and research organisations are involved in 46 research projects to ensure that OWL remains in a leading position in the development of smart factories and the global competitive advantage they will offer.

THE CAPITAL OF HIGHER EDUCATION AND RESEARCH & DEVELOPMENT

The 72 universities and technology colleges in NRW guarantee businesses access to

a highly qualified and skilled workforce. The region's 716,500 students - 81,900 of which come from overseas - benefit from Germany's dual education system that links practical learning in a company with theoretical learning at school and ensures that graduates are ready to contribute in the workplace. The universities, along with more than 60 technology centers and more than 50 non-university research facilities, comprise one of the densest research networks in Europe and help to keep the region at the forefront of the digital revolution.

THE GATEWAY TO EUROPE

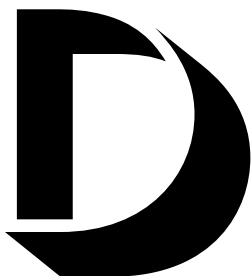
The location of NRW and its strong infrastructure give the region a competitive business advantage. It has direct access to a huge market: more than 156 million people live within a 500km-radius of the state capital, Düsseldorf, representing 45% of the purchasing power in the EU.

By air, road, train or sea, NRW possesses excellent internal and international transport links. The two major international airports are Düsseldorf airport and Cologne Bonn airport, and the region boasts the highest rail network density in Germany. NRW is also the largest location for inland ports in Germany, and has access to 226 kilometres of the Rhine. Each year 120 ports handle approximately 126 million tonnes of goods by ship.

NRW's position as the biggest trade fair location in the world ensures that the region is a major destination for business visitors, with more than 100 international trade fairs hosted across Cologne, Dortmund, Düsseldorf and Essen bringing over 6 million people to the region each year.



FUNNY GUY: Riad Sattouf's graphic memoir, *The Arab of the Future*, about growing up in Libya and Syria, is part of a wave of French graphic novels and comic books coming to English-language markets.



DOWNTIME

SPORTS

ART

PHOTOGRAPHY

DINING

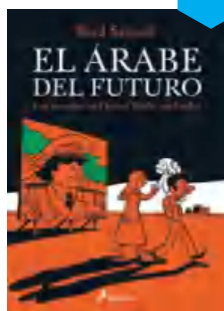
STYLE

MOVIES

THE PENCIL IS MIGHTIER

Riad Sattouf's graphic memoir takes on new importance after the November 13 attacks in Paris

THE ARAB OF THE FUTURE:
A Childhood in The Middle East 1978-1984



BY
BRIAN EADS

FRANCE COULD use a reason to laugh right about now. Fortunately, in legendary comic book characters Asterix and Obelix, they have two reasons. First published in 1959, their comic series, *The Adventures of Asterix*, follows the two troublemaking Gauls as they resist occupation by the Romans through high jinks and magic. Two million copies of the 36th installment of their series, titled *Asterix and the Missing Scroll*, were printed in Paris in October of this year, with another 2 million printed in English and other languages. More will likely follow, given the last book featuring the characters, 2013's *Asterix and the Picts*, sold more than 5.4 million copies worldwide. Those numbers only added to the duo's expansive empire, which consists of nine animated movies, four live-action films starring Gérard Depardieu, a video game and even a Disneyland-style theme park in France.

Next to Japan and its ubiquitous manga, no country produces more comics than France.

More than 5,000 are published every year and sold in the scores of bookshops across the country devoted to the genre. In the southwestern French town Angoulême, there's even the international city of comics (*bande dessinée*, or *BD*, in French), with a museum, a vast library, authors-in-residence, rotating exhibitions, an annual festival and an awards ceremony—the cartoon world's equivalent of Hollywood's Oscars.

The next logical step for French comic publishers, then, is establishing an international fan base. In July, Delcourt—France's largest independent graphic novel publisher—said it would release 150 titles in English over the next 12 months. They'll be offered in digital format in collaboration with ComiXology, a website that dominates the U.S. comic book market. Among them will be *The Curse of the Wendigo*, a World War I fantasy illustrated by *The Walking Dead* comic artist Charlie Adlard, and *Come Prima (As Before)* by Alfred, which follows two Italian brothers in the 1950s



as they try to deal with their country's troubled past. ComiXology co-founder David Steinberger describes the partnership as the beginning of the French invasion into the English-language comic market. "It's high time that French comics take their rightful place," he says.

The newest star in the world of French illustrators feels especially prescient given the country's recent history. He's not a muscle-bound, spandex-clad Frenchie endowed with miraculous powers, fighting injustice or saving Gotham City from crazed ne'er-do-wells in the manner typical of the American superhero. He's Riad Sattouf, a mild-mannered, 37-year-old cartoonist and filmmaker born in Paris to a French mother and a Syrian father. His latest work, *The Arab of the Future: A Childhood in the Middle East, 1978-1984*, was published in English this October by Metropolitan Books in New York. The graphic memoir tells of Sattouf's unusual childhood or, as the blurb on the back cover puts it, "the true story of a blond child and his family in Gaddafi's Libya and Hafez Al-Assad's Syria."

The memoir has already sold 300,000 copies in French since it was published in May last year, and it won the top prize at the Angoulême International Comics Festival in February. Since then, it's been published in 14 languages. Riva Hocherman, Sattouf's U.S. editor, describes it as "a ground-up view of life as experienced by ordinary people in Libya and Syria in the 1980s, seen through the unquestioning perspective of a child, without judgment or explanation."

The follow-up volume was published in France in July this year and has already sold 200,000 copies. Two further volumes will follow Sattouf into his early teens. Though the author won't say much about them, he discloses that they will include the story of how he lost his flowing blond locks—featured prominently in the story's first volume, where they're described as "blowing in the wind like those of a Californian actress." Today, his hair and beard are jet black. "It was the end of paradise for me," he says with a grin.

Sattouf has become the toast of the burgeoning French comic world just as it takes the

international stage, though he's been well-known in the country for years. Among his previous graphic novels are *My Circumcision*, the plot of which is probably self-explanatory; *No Sex in New York*, a title chosen after he heard that the words *sex* and *New York* sell books; and *Pascal Brutal*, whose eponymous hero, a super-macho Breton, inhabits a dystopian future. He has directed two films in France: 2009's *The French Kissers*, which earned positive reviews and strong numbers at the box office, and 2014's *Jacky in the Women's Kingdom*, which earned neither.

For nearly a decade, he had a page in *Charlie Hebdo* called "The Secret Life of Youth," which featured vignettes of everyday events he'd observed on the streets of Paris. Unlike much of the paper, his cartoons were apolitical and inoffensive. He submitted them via email, didn't attend the weekly editorial meetings and left to work for

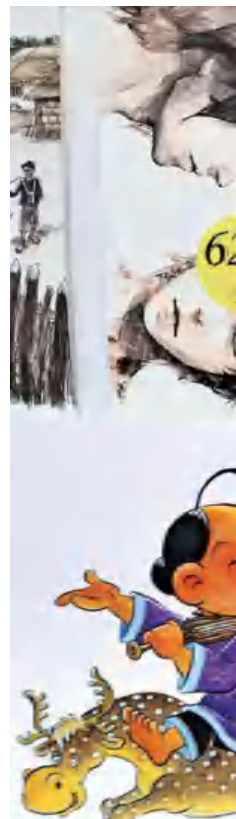
"THE IDEA OF NATIONALITY IS OUTDATED. MY NATIONALITY IS CARTOONIST."

another French weekly, *Le Nouvel Observateur*, before the shooting by two Islamist gunmen in January this year killed 10 of the paper's employees.

Sattouf thought for many years about telling the story of his childhood but was unsure how to shape it. "I'm not a big fan of autobiography," he tells *Newsweek*. "Some authors are too kind to themselves and their families. I like things to be raw, real." He wrote a first version of the story but was unhappy with it and put it aside.

Disaster motivated him to try again. When civil war broke out in Syria in 2011, members of his family in his father's ancestral village of Ter Maaleh, near the city of Homs, were close to a combat zone. Sattouf foresaw the coming chaos and set about helping them come to France, but getting permission from the French authorities was a bureaucratic nightmare. "I had a lot of difficulties," he explains. "I was very angry with France. I'd meet immigration officials, civil servants who would say, 'You really should do a comic book on this.' So I decided to tell the story from the beginning."

The book is not a polemic about the Middle East. Yet in remembered scenes through the eyes of a detached and occasionally melancholic child, truths about 1980s Libya and Syria emerge. Everything morphs as the setting changes, from



the tone of young Sattouf's narration to the colors of the drawings: blue for France and the sea near his maternal grandparents' home in Brittany, yellow for sun-drenched Libya and pink for the laterite soil of Syria. It was important to work from memory, Sattouf says, and his recollections are vivid, sometimes sweet, occasionally shocking and stretching back to when he could only crawl.

On the cover of the first volume of *The Arab of the Future* is a realistic, detailed drawing of Muammar el-Qaddafi, in colonel's dress uniform and opaque, black sunglasses, looking out imperiously from a Libyan billboard. It's the image of the dictator that the infant Sattouf saw more than 30 years ago, of what he calls "an impressive, virile strongman—like a rock star." It's a departure from how Sattouf draws himself and his father (the central character in the book), who are also shown on the cover but in a harsh caricature, with big, bulbous noses, big hair and elastic facial expressions in classic cartoon style.

So who is the "Arab of the future"? Not Sattouf, it seems. "The idea of nationality is outdated, worm-eaten," he says. "My nationality is cartoonist!" The term comes from his father, he explains. The youngest child of a poor peasant

family, Abdel-Razak Sattouf was the only one to receive an education, eventually earning a doctorate in history at La Sorbonne in Paris. An eternal optimist, he believed the Arab of the future must go to school, escape ignorance and achieve enlightenment. That way, he could match and even overtake France and the West by building a postcolonial, nationalist Arab utopia. As seen in the book, Sattouf's father was so eager to be a part of the dream that he turned down an appointment at Oxford University and a teaching position in Qaddafi's Libya. "When we are young, we think we can change everything," says Sattouf. "Then we fail."

"He's telling us the Arab dreams were fake. It was a hoax," says Karim Bitar, a senior fellow and Middle East specialist at the Institute for International and Strategic Affairs in Paris who has followed Sattouf's career. "He saw at an early age that the promise of a secular, authoritarian, nationalist utopia was a lie." Sattouf's story illuminates why that vision failed, contextualizing modern extremism as, in part, a backlash after decades of dictatorships that suppressed religion in the Middle East. "The extreme secular nationalism that we see in Sattouf's work ceded the place to religious zeal," Bitar says.

The Arab of the Future is not the first French graphic novel to seem prophetic. *Persepolis* tells in four volumes the story of its author, Marjane Satrapi, and her childhood in Iran during the country's eight-year war with Iraq. Its first volume was published in French in 2000, but didn't get its first English translation until 2004—after the post-9/11 Iraq War had already begun. It resonated: *Persepolis* topped the U.S. graphic books best-seller list, and its 2007 movie adaptation was nominated for an Academy Award.

Sattouf's graphic novels seem similarly poised for international takeover. "They are the most powerful means of expression," the author says of comics. "They were the first: cave paintings of cattle and hunters, hieroglyphics in ancient Egypt. They are understandable by anyone, a universal language." And they're a language Riad Sattouf speaks fluently. ■

COMIC HEAVEN: A stall at the international comic books festival in Angoulême, France. The town has a museum, a library and an award ceremony—the Oscars of cartoons.

PIERRE ANDRIEU/AFP/GETTY





FORK IT OVER

Are the world's priciest restaurants worth the expense?

THE NEWS spread quickly among British food lovers late last year: A newly opened sushi bar in London with nine seats had obtained the dubious honor of becoming the most expensive restaurant in Britain. The cost of dinner for one at the Araki, named for owner-chef Mitsuhiro Araki, is about \$450. And that's without sake or service. All nine seats at the Araki are booked for weeks in advance. Araki has acknowledged that his restaurant is pricey, but he justifies this by explaining that he sources the finest produce he can find—squid from South Africa, bluefin tuna from Ireland and Portugal, Alba truffles from Italy. And to be fair to him, he does produce the best sushi and seafood in London.

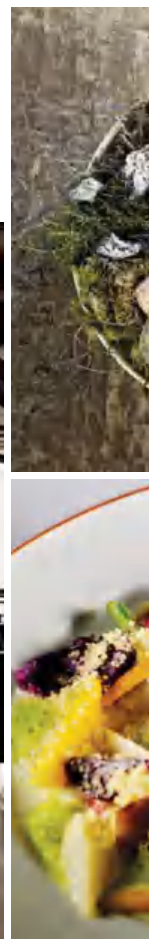
Wonderful meal or not, \$450 per person is pretty steep. Can any meal be worth that stunningly hefty bill? That may be an unanswerable question, but here's an attempt to measure what you can get for your money at some of the world's most expensive restaurants.

The Araki, it turns out, is a good deal compared with the most expensive restaurant on the planet. That would be Sublimotion in Ibiza. I hope you're sitting down, because to sit down at Sublimotion costs about \$1,600 per person. The restaurant's chef and proprietor, Pablo Roncero, is a modernist in the same tradition as Ferran Adrià, whose El Bulli was considered the best in the world until he closed it in 2011. At Sublimotion, the entire performance is surrealistic. The dining room features a single white table and 12 white chairs. Nearly 30 people



behind the scenes use this setting to project different sounds and dramatic images—from the grounds of Versailles to icebergs in the Arctic—while waitresses dressed like air hostesses serve 20 courses. The cuisine is unashamedly modernist and features nitrogen-frozen spherical olives suspended on a laundry line complete

BY
BRUCE PALLING
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TOP BILLING:
Shell games from
Fäviken, revelatory
vegetables from
L'Arpège, and
the soon-to-be-
shuttered dining
room at Noma.



with clothespins and a foie gras doughnut that enters the room attached to a balloon. Although Roncero boasts that this is “the first gastronomic show in the world,” others have pointed out that it owes a conceptual debt to Ultraviolet in Shanghai, the brainchild of French chef Paul Pairet, who charges a more modest \$600 per person.

And what of France, traditional home of the world’s finest cuisine? At first glance, L’Arpège in Paris doesn’t sound like a good deal. Where, you might be tempted to ask, is the beef? The nightly set dinner is dominated by vegetable dishes, and at about \$425 per person, L’Arpège might be the most expensive restaurant in France. I first dined there nearly 25 years ago, when Alain Passard was a promising young chef—although his food then was cuisine grand-mère, or dishes reminiscent of what one’s grandparents would have served. At the turn of the century, after the outbreak of mad cow disease in Britain, Passard decided to stop serving red meat. He focused instead on superlative vegetables. His signature dish of tomato soup with a dollop of mustard ice cream has to rank as one of the most intensely flavored experiences you could ever have. If any meal can be called life-changing, it’s dinner at L’Arpège. So perhaps the price tag is not that outrageous.

But a restaurant does not have to be innovative to be stratospherically expensive—Le Louis Quinze in Monaco, the first of Alain Ducasse’s stable to win three Michelin stars, serves classic French food. The dishes are simple, delicious—and pricey. Try the raw San Remo prawns on a rockfish jelly with a hefty dollop of the finest Schrencki caviar from China for about \$170, or the sea bass with fennel and citrus for about \$121.

The most expensive in Italy is Enoteca Pinchiorri, in Florence. Although chef Annie Féolde gained three Michelin stars in 1993, her French-inspired cuisine is not the only attraction for wealthy diners. Her husband, Giorgio Pinchiorri, has long been obsessed with fine wine, so much so that he possesses upward of 130,000 bottles of the 20th century’s greatest vintages. Giorgio might playfully offer an Italy vs. France taste test—serving a Sassicaia 1985 alongside, say, a Mouton Rothschild 1982—so the diner can compare. Those are expensive games but hard to forget.

Now that the high-end culinary world is dominated by the Nordic countries, it is inevitable that their very best establishments are pricey. René Redzepi, the genius chef at Noma in Copenhagen, occasionally shocks people by serving live

shrimps on a bed of ice or ants for consumption. He too searches for perfect ingredients, whether they are sea urchins from the Arctic Circle or fat langoustines from the chilly waters off Trondheim in Norway. You come away from the 20-course dinner, priced at about \$250 a head, with the sense that you have encountered entirely new flavors. Noma is about to move to Sydney for several months, where the cost per person will be eye-watering: about \$360 per head, which will make it Australia’s priciest dining experience.

The most expensive restaurant in Sweden—another Nordic country experiencing a food revolution—is Björn Frantzén’s eponymous, two-Michelin-starred establishment in Stockholm. The cost: about \$260 per person. Although Frantzén is passionate about produce he does not insist that it be local if some other region offers superior quality. He is inspired by Japanese cuisine. One dish labeled “sashimi” on the menu is decidedly Scandinavian—raw Swedish lobster with lemon and algae emulsion, as well as radishes and grated horseradish.

For those who want to stick to the Nordic table,

THE CUISINE IS UNASHAMEDLY MODERNIST AND FEATURES NITROGEN-FROZEN OLIVES SUSPENDED ON A LAUNDRY LINE AND A FOIE GRAS DONUT ATTACHED TO A BALLOON.

the alternative is Magnus Nilsson’s Fäviken, which is several hundred miles north of Stockholm. Only fractionally cheaper than Frantzén, Fäviken has incomparable produce and challenging dishes such as lightly salted wild trout roe served in a warm crust of dried pig’s blood, and bone marrow extracted from baseball-bat-sized bones hacked open on the table.

In all of these restaurants, you are purchasing not just sustenance but an experience that might transform the way you think about food. The cost is high, but perhaps only three or four times more than an ordinary and unmemorable meal at a fashionable restaurant in any major city. And if, for that, you have an experience that lingers in the memory for years and challenges or changes the way you eat, perhaps you have spent wisely. **N**



THE CURATED LIFE

BEST CASE SCENARIO

In an era of cookie-cutter black nylon suitcases, Moynat's exquisitely crafted luggage makes flying glamorous again

A FEW YEARS ago, I wrote a history of the jet set. That book reminded me that at one time flying was glamorous. Now, of course, almost all the pleasure has been leeched out of it, and the carousels laden with body-bag-sized wheeled luggage are dreary testimony to the aesthetic dullness of it all—wardrobe trunks plastered with the labels of grand resorts are seen only in adaptations of Agatha Christie novels.

It is a pity because advances in travel have tended to yield interesting luggage. The rise of the railway bequeathed us the women's handbag and straight-sided luggage that could be stacked or slotted under seats. Motoring brought a delicious array of specialized luggage—footrest trunks, running board trunks, spare tire trunks and more. Even the branded airline bags of the early jet era had a certain cachet, as that literary master of product placement Ian Fleming recognized when writing the short story "For Your Eyes Only," equipping two assassins with "that new holdall of the tropics—a Pan American overnight bag."

Today, the glamour of travel has passed into history. Therefore, I believe we owe it to ourselves to do what we can with our cabin luggage, which is why I was happy to find Moynat a few years ago. Just as they have haute cuisine and haute couture, so the French have a word for what they do at Moynat: They call it *haute maroquinerie*. Moynat began, as did so much of the French luxury goods industry, during the reign of Napoleon III, by

far the best Napoleon, to my mind. Anyone who has read later Honoré de Balzac and Émile Zola will be aware of the orgy of consumption France embarked upon then, and Pauline Moynat helped to meet the growing demand for beautifully made bags, suitcases and other forms of luggage.

At its height, the firm had 250 craftsmen working in a factory in Montmartre and ticked all the boxes on the 19th- and early 20th-century luxury brand checklist: winning medals at World's Fairs and exhibitions (five gold, six silver and two bronze at the Exposition Internationale des Arts Décoratifs et Industriels Modernes—hence the term art deco); identifying itself with the newly fashionable motor car (exhibiting at the Paris motor show from 1905 onward); creating extravagant bespoke orders; and devising such ingenious things as the motorist's mobile kitchen, which included a stove and place settings for six. In the days of coach-built motor cars that required bespoke luggage, when crossing the Atlantic by ocean liner took almost a week and required several changes of clothes packed carefully into wardrobe trunks, and when an army of uniformed porters and chauffeurs could be relied upon to do the heavy lifting, Moynat flourished.

But by 1976—the age of the jumbo jet and mass air travel—Moynat had closed its doors, and they were not to reopen until 2011, when, like a patient awaking from a 35-year coma, it found the world much changed. And it recognized

THE PAULINE, TOP,
AND THE BALLERINE



BY
NICHOLAS FOULKES



BAG MAN: Pharrell Williams, seen here with a large Pauline travel bag, is working with Moynat on developing a special line of handbags.

the need to adapt. Opening in a crowded marketplace at the nadir of a global economic crisis may not have been in its favor, but Moynat had a trump card: Its new owner is Bernard Arnault, the richest person in France. Arnault, the major investor in dozens of celebrated luxury brands, has made Moynat into what is in effect a laboratory of luxury luggage, a very haute skunk-works division under the creative eye of Ramesh Nair.

Nair is engagingly eccentric, with a dry English sense of humor and a boyish enthusiasm for the job of making a very small number of very expensive bags to the highest standards. His task has been to address the needs of people who need nothing while performing a sort of *Jurassic Park*-style resurrection of a house style, taking signature elements from the past and placing them in the present. Thus, he has brought back the distinctive cat's tongue lock and the *poignée pont* Moynat—a leather-covered metal handle.

But these visual quotations would mean little were it not for the care with which things are made. It is not just exotic skins that defines Moynat—textured Taurillon and glossy box calf leathers are the favored materials—but rather the execution. Things are done with a forensic, almost fanatical attention to details the customer will never see. Instead of rubber hose, the handles of the soft luggage are built around a core of cord. The more rigid handles are built upon metal hoop using layers of leather, skived to translucence, that taper to the desired, comfortable rounded

profile. Zip tabs are hand-stained even on interior faces, which are stitched together. Piping is built around not a nylon filament but a piece of cotton thread—a detail that will become apparent only when you have had your bag for many years.

I mention that because you will want to use your Moynat bag until it needs to be returned for repair, as it is so cleverly thought out. The Moynat holdall is a miracle that, with the exception of the zip and a discreet steel buckle, dispenses with extraneous metalwork. (For me, the absence of metallic bling tends to denote quality.) Even the handles are secured without using visible metal fittings; instead, the leather of the handles loops through slots in the top, which is reinforced with slender metal rods concealed between the lining and leather, to stop deformation. Instead of clunky metal D rings for the shoulder strap, there are discreet leather loops, one of which is tucked behind the side pocket. There is also a slit-like opening between the body of the bag and the outer pocket, into which can be slotted a passport or phone for easy access. The outer pocket, by the way, is called a *poche officier* and was taken from an old Moynat military holdall Nair found at a flea market.

This ingenious construction has been taken one step further in the holdall clutch—a piece that is somewhere between a man bag and a document case—which in effect sees the front panel of the holdall removed and turned into a triumvirate of pockets: zipped, open and strap-fastened military.

I am not one for man bags, but I immediately fell for the Moynat holdall clutch when I saw it in Paris recently. It was Fashion Week (isn't it always?), and it seemed purpose-built for the

NAIR'S TASK HAS BEEN TO ADDRESS THE NEEDS OF PEOPLE WHO NEED NOTHING.

fashionista on the run: a zip pocket for the iPad, a pouch pocket for a phone and personal effects, and a slit for marshaling invitations.

I keep a fairly close eye on Moynat but clearly not close enough, as this item had passed me by. I asked when it had launched and was told *launch* wasn't really in the Moynat vocabulary. Such is the company's minimal production that as soon as one is made, it goes into the shop and then out under the arm of a customer. **N**

REWIND

20
YEARS



DECEMBER 4, 1995

CRIMINOLOGIST JAMES ALAN FOX,
IN A REPORT ON DECLINING CRIME
RATES IN THE MID-1990S

“A 14-year-old
with a gun
in his hand
is far more
menacing
than an adult
because a

teenager will pull the trigger
without fully considering the
consequences. He'll pull the
trigger over a leather jacket,
a pair of sneakers or a joke.”

A close-up, high-contrast photograph of a gorilla's face, focusing on its eye and nose. The gorilla's fur is dark and textured, and its eye is a striking yellowish-brown color. The lighting is dramatic, highlighting the contours of its face.

HELP SAVE THE 'WOW'

These giants of the animal kingdom need help. Despite their strength and cunning they're no match for a poacher's rifle. For 50 years WWF has been securing protected areas worldwide, but these aren't enough to stop the killing. To disrupt the sophisticated criminal gangs supplying animal parts to lucrative illegal markets, we are working with governments to toughen law enforcement. We're also working with consumers to reduce the demand for unlawful wildlife products. Help us look after the world where you live at panda.org/50



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